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NOVELL DISKLESS 3 USER SYSTEM \$4728



Novell Netware 2.x



386 File Server

286 12MHz



286 12MHz



No. of Workstations	Added Topology Station Port	Shared Topology Station Port	No. of Workstations	Added Topology Station Port	Shared Topology Station Port
2	\$6,740.00	\$6,000.00	3	\$6,476.00	\$5,844.00
4	\$6,854.00	\$6,000.00	6	\$6,414.00	\$5,810.00
6	\$6,548.00	\$7,119.00	9	\$6,139.00	\$5,810.00
8	\$6,715.00	\$6,770.00	12	\$6,045.00	\$5,810.00
10	\$6,879.00	\$6,770.00	15	\$6,045.00	\$5,810.00
12	\$7,043.00	\$6,770.00	18	\$6,045.00	\$5,810.00
14	\$7,208.00	\$6,770.00	21	\$6,045.00	\$5,810.00
16	\$7,372.00	\$6,770.00	24	\$6,045.00	\$5,810.00
18	\$7,536.00	\$6,770.00	27	\$6,045.00	\$5,810.00
20	\$7,699.00	\$6,770.00	30	\$6,045.00	\$5,810.00
22	\$7,863.00	\$6,770.00	33	\$6,045.00	\$5,810.00
24	\$8,027.00	\$6,770.00	36	\$6,045.00	\$5,810.00
26	\$8,191.00	\$6,770.00	39	\$6,045.00	\$5,810.00
28	\$8,355.00	\$6,770.00	42	\$6,045.00	\$5,810.00
30	\$8,519.00	\$6,770.00	45	\$6,045.00	\$5,810.00
32	\$8,683.00	\$6,770.00	48	\$6,045.00	\$5,810.00
34	\$8,847.00	\$6,770.00	51	\$6,045.00	\$5,810.00
36	\$9,011.00	\$6,770.00	54	\$6,045.00	\$5,810.00
38	\$9,175.00	\$6,770.00	57	\$6,045.00	\$5,810.00
40	\$9,339.00	\$6,770.00	60	\$6,045.00	\$5,810.00
42	\$9,503.00	\$6,770.00	63	\$6,045.00	\$5,810.00
44	\$9,667.00	\$6,770.00	66	\$6,045.00	\$5,810.00
46	\$9,831.00	\$6,770.00	69	\$6,045.00	\$5,810.00
48	\$9,995.00	\$6,770.00	72	\$6,045.00	\$5,810.00
50	\$10,159.00	\$6,770.00	75	\$6,045.00	\$5,810.00
52	\$10,323.00	\$6,770.00	78	\$6,045.00	\$5,810.00
54	\$10,487.00	\$6,770.00	81	\$6,045.00	\$5,810.00
56	\$10,651.00	\$6,770.00	84	\$6,045.00	\$5,810.00
58	\$10,815.00	\$6,770.00	87	\$6,045.00	\$5,810.00
60	\$10,979.00	\$6,770.00	90	\$6,045.00	\$5,810.00
62	\$11,143.00	\$6,770.00	93	\$6,045.00	\$5,810.00
64	\$11,307.00	\$6,770.00	96	\$6,045.00	\$5,810.00
66	\$11,471.00	\$6,770.00	99	\$6,045.00	\$5,810.00
68	\$11,635.00	\$6,770.00	102	\$6,045.00	\$5,810.00
70	\$11,799.00	\$6,770.00	105	\$6,045.00	\$5,810.00
72	\$11,963.00	\$6,770.00	108	\$6,045.00	\$5,810.00
74	\$12,127.00	\$6,770.00	111	\$6,045.00	\$5,810.00
76	\$12,291.00	\$6,770.00	114	\$6,045.00	\$5,810.00
78	\$12,455.00	\$6,770.00	117	\$6,045.00	\$5,810.00
80	\$12,619.00	\$6,770.00	120	\$6,045.00	\$5,810.00
82	\$12,783.00	\$6,770.00	123	\$6,045.00	\$5,810.00
84	\$12,947.00	\$6,770.00	126	\$6,045.00	\$5,810.00
86	\$13,111.00	\$6,770.00	129	\$6,045.00	\$5,810.00
88	\$13,275.00	\$6,770.00	132	\$6,045.00	\$5,810.00
90	\$13,439.00	\$6,770.00	135	\$6,045.00	\$5,810.00
92	\$13,603.00	\$6,770.00	138	\$6,045.00	\$5,810.00
94	\$13,767.00	\$6,770.00	141	\$6,045.00	\$5,810.00
96	\$13,931.00	\$6,770.00	144	\$6,045.00	\$5,810.00
98	\$14,095.00	\$6,770.00	147	\$6,045.00	\$5,810.00
100	\$14,259.00	\$6,770.00	150	\$6,045.00	\$5,810.00
102	\$14,423.00	\$6,770.00	153	\$6,045.00	\$5,810.00
104	\$14,587.00	\$6,770.00	156	\$6,045.00	\$5,810.00
106	\$14,751.00	\$6,770.00	159	\$6,045.00	\$5,810.00
108	\$14,915.00	\$6,770.00	162	\$6,045.00	\$5,810.00
110	\$15,079.00	\$6,770.00	165	\$6,045.00	\$5,810.00
112	\$15,243.00	\$6,770.00	168	\$6,045.00	\$5,810.00
114	\$15,407.00	\$6,770.00	171	\$6,045.00	\$5,810.00
116	\$15,571.00	\$6,770.00	174	\$6,045.00	\$5,810.00
118	\$15,735.00	\$6,770.00	177	\$6,045.00	\$5,810.00
120	\$15,899.00	\$6,770.00	180	\$6,045.00	\$5,810.00
122	\$16,063.00	\$6,770.00	183	\$6,045.00	\$5,810.00
124	\$16,227.00	\$6,770.00	186	\$6,045.00	\$5,810.00
126	\$16,391.00	\$6,770.00	189	\$6,045.00	\$5,810.00
128	\$16,555.00	\$6,770.00	192	\$6,045.00	\$5,810.00
130	\$16,719.00	\$6,770.00	195	\$6,045.00	\$5,810.00
132	\$16,883.00	\$6,770.00	198	\$6,045.00	\$5,810.00
134	\$17,047.00	\$6,770.00	201	\$6,045.00	\$5,810.00
136	\$17,211.00	\$6,770.00	204	\$6,045.00	\$5,810.00
138	\$17,375.00	\$6,770.00	207	\$6,045.00	\$5,810.00
140	\$17,539.00	\$6,770.00	210	\$6,045.00	\$5,810.00
142	\$17,703.00	\$6,770.00	213	\$6,045.00	\$5,810.00
144	\$17,867.00	\$6,770.00	216	\$6,045.00	\$5,810.00
146	\$18,031.00	\$6,770.00	219	\$6,045.00	\$5,810.00
148	\$18,195.00	\$6,770.00	222	\$6,045.00	\$5,810.00
150	\$18,359.00	\$6,770.00	225	\$6,045.00	\$5,810.00
152	\$18,523.00	\$6,770.00	228	\$6,045.00	\$5,810.00
154	\$18,687.00	\$6,770.00	231	\$6,045.00	\$5,810.00
156	\$18,851.00	\$6,770.00	234	\$6,045.00	\$5,810.00
158	\$19,015.00	\$6,770.00	237	\$6,045.00	\$5,810.00
160	\$19,179.00	\$6,770.00	240	\$6,045.00	\$5,810.00
162	\$19,343.00	\$6,770.00	243	\$6,045.00	\$5,810.00
164	\$19,507.00	\$6,770.00	246	\$6,045.00	\$5,810.00
166	\$19,671.00	\$6,770.00	249	\$6,045.00	\$5,810.00
168	\$19,835.00	\$6,770.00	252	\$6,045.00	\$5,810.00
170	\$19,999.00	\$6,770.00	255	\$6,045.00	\$5,810.00
172	\$20,163.00	\$6,770.00	258	\$6,045.00	\$5,810.00
174	\$20,327.00	\$6,770.00	261	\$6,045.00	\$5,810.00
176	\$20,491.00	\$6,770.00	264	\$6,045.00	\$5,810.00
178	\$20,655.00	\$6,770.00	267	\$6,045.00	\$5,810.00
180	\$20,819.00	\$6,770.00	270	\$6,045.00	\$5,810.00
182	\$20,983.00	\$6,770.00	273	\$6,045.00	\$5,810.00
184	\$21,147.00	\$6,770.00	276	\$6,045.00	\$5,810.00
186	\$21,311.00	\$6,770.00	279	\$6,045.00	\$5,810.00
188	\$21,475.00	\$6,770.00	282	\$6,045.00	\$5,810.00
190	\$21,639.00	\$6,770.00	285	\$6,045.00	\$5,810.00
192	\$21,803.00	\$6,770.00	288	\$6,045.00	\$5,810.00
194	\$21,967.00	\$6,770.00	291	\$6,045.00	\$5,810.00
196	\$22,131.00	\$6,770.00	294	\$6,045.00	\$5,810.00
198	\$22,295.00	\$6,770.00	297	\$6,045.00	\$5,810.00
200	\$22,459.00	\$6,770.00	300	\$6,045.00	\$5,810.00
202	\$22,623.00	\$6,770.00	303	\$6,045.00	\$5,810.00
204	\$22,787.00	\$6,770.00	306	\$6,045.00	\$5,810.00
206	\$22,951.00	\$6,770.00	309	\$6,045.00	\$5,810.00
208	\$23,115.00	\$6,770.00	312	\$6,045.00	\$5,810.00
210	\$23,279.00	\$6,770.00	315	\$6,045.00	\$5,810.00
212	\$23,443.00	\$6,770.00	318	\$6,045.00	\$5,810.00
214	\$23,607.00	\$6,770.00	321	\$6,045.00	\$5,810.00
216	\$23,771.00	\$6,770.00	324	\$6,045.00	\$5,810.00
218	\$23,935.00	\$6,770.00	327	\$6,045.00	\$5,810.00
220	\$24,099.00	\$6,770.00	330	\$6,045.00	\$5,810.00
222	\$24,263.00	\$6,770.00	333	\$6,045.00	\$5,810.00
224	\$24,427.00	\$6,770.00	336	\$6,045.00	\$5,810.00
226	\$24,591.00	\$6,770.00	339	\$6,045.00	\$5,810.00
228	\$24,755.00	\$6,770.00	342	\$6,045.00	\$5,810.00
230	\$24,919.00	\$6,770.00	345	\$6,045.00	\$5,810.00
232	\$25,083.00	\$6,770.00	348	\$6,045.00	\$5,810.00
234	\$25,247.00	\$6,770.00	351	\$6,045.00	\$5,810.00
236	\$25,411.00	\$6,770.00	354	\$6,045.00	\$5,810.00
238	\$25,575.00	\$6,770.00	357	\$6,045.00	\$5,810.00
240	\$25,739.00	\$6,770.00	360	\$6,045.00	\$5,810.00
242	\$25,903.00	\$6,770.00	363	\$6,045.00	\$5,810.00
244	\$26,067.00	\$6,770.00	366	\$6,045.00	\$5,810.00
246	\$26,231.00	\$6,770.00	369	\$6,045.00	\$5,810.00
248	\$26,395.00	\$6,770.00	372	\$6,045.00	\$5,810.00
250	\$26,559.00	\$6,770.00	375	\$6,045.00	\$5,810.00
252	\$26,723.00	\$6,770.00	378	\$6,045.00	\$5,810.00
254	\$26,887.00	\$6,770.00	381	\$6,045.00	\$5,810.00
256	\$27,051.00	\$6,770.00	384	\$6,045.00	\$5,810.00
258	\$27,215.00	\$6,770.00	387	\$6,045.00	\$5,810.00
260	\$27,379.00	\$6,770.00	390	\$6,045.00	\$5,810.00
262	\$27,543.00	\$6,770.00	393	\$6,045.00	\$5,810.00
264	\$27,707.00	\$6,770.00	396	\$6,045.00	\$5,810.00
266	\$27,871.00	\$6,770.00	399	\$6,045.00	\$5,810.00
268	\$28,035.00	\$6,770.00	402	\$6,045.00	\$5,810.00
270	\$28,199.00	\$6,770.00	405	\$6,045.00	\$5,810.00
272	\$28,363.00	\$6,770.00	408	\$6,045.00	\$5,810.00
274	\$28,527.00	\$6,770.00	411	\$6,045.00	\$5,810.00
276	\$28,691.00	\$6,770.00	414	\$6,045.00	\$5,810.00
278	\$28,855.00	\$6,770.00	417	\$6,045.00	\$5,810.00
280	\$29,019.00	\$6,770.00	420	\$6,045.00	\$5,810.00
282	\$29,183.00	\$6,770.00	423	\$6,045.00	\$5,810.00
284	\$29,347.00	\$6,770.00	426	\$6,045.00	\$5,810.00
286	\$29,511.00	\$6,770.00	429	\$6,045.00	\$5,810.00
288	\$29,675.00	\$6,770.00	432	\$6,045.00	\$5,810.00
290	\$29,839.00	\$6,770.00	435	\$6,045.00	\$5,810.00
292	\$29,903.00	\$6,770.00	438	\$6,045.00	\$5,810.00
294	\$30,067.00	\$6,770.00	441	\$6,045.00	\$5,810.00
296	\$30,231.00	\$6,770.00	444	\$6,045.00	\$5,810.00
298	\$30,395.00	\$6,770.00	447	\$6,045.00	\$5,810.00
300	\$30,559.00	\$6,770.00	450	\$6,045.00	\$5,810.00
302	\$30,723.00	\$6,770.00	453	\$6,045.00	\$5,810.00
304	\$30,887.00	\$6,770.00	456	\$6,045.00	\$5,810.00
306	\$31,051.00	\$6,770.00	459	\$6,045.00	\$5,810.00
308	\$31,215.00	\$6,770.00	462	\$6,045.00	\$5,810.00
310	\$31,379.00	\$6,770.00	465	\$6,045.00	\$5,810.00
312	\$31,543.00	\$6,770.00	468	\$6,045.00	\$5,810.00
314	\$31,707.00	\$6,770.00	471	\$6,045.00	\$5,810.00
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From the Editor

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B.C. edition - March 2011



High-magnitude

High-speed railroads become very much an issue for us these months with the opening of our new Toronto subway. We are witnessing an online race of this high technology of travel between nations of the world. The Chinese and India spent millions of dollars racing up. We had planned four major railroads in Canada, no high-speed railroads because high-speed rail is expensive—and hopefully unnecessary—subject to buy. Keeping in mind what was decided, until spent on over three thousand miles of tracks, results in a top priority.

We have had our ups and downs with education recently. We have an otherwise solid program which we can reasonably believe people will use. From 20 million to 30 million people are using or are using as we see it, as implied and described, new programs and classroom kits. Furthermore, our research is now reaching considerable merit, there are reported no upgradings and revisions, and so much has been done. The results, I think, are quite good.

Eventually gas flows by upward migration, but sometimes the gas remains in the reservoir and migrates to surface in leaking zones. This process may be slow and have several stages in the migration of the hydrocarbon gases. (This stage is called the "maturity" of the oil.) The final stage is called "depletion" or "exhaustion" when no oil is left in the reservoir. (If you thought "maturity" was some sort of rest, you're right.)

you will forgive, how many we see now here basking in the evening sun?" "A few," I said. "I could tell you that we have grown. For example, as always, especially

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on the old stage road in Vancouver, will be the start, a new newspaper there for Vancouver. I shall plainly print those pages, but let you get the idea that "what kind of newspaper should I get for my sister?" is a question answered sufficiently and let George take care to send his copy over here.

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Baron, George Clinton

Wittenberg School

Issue	Title	Copy	Carries Ready	Classification
Apr '21	Customer Privacy - Consumer Personal Information Management	Mar 10	Mar 20	Top 1
May '21	Windows 10 KB46367 Updates for Manufacturing	Apr 10	May 10	Top 1
June '21	Update Patch Tuesday - April 2021 MS1 - 2021 - Microsoft Windows Software	May 10	May 20	Top 1

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Carpal Tunnel Syndrome Is Covered by Workers' Comp.

By Michael A. Karr, Computer Lawyer
In prior January, 1992 issue in this section about the Workers' Compensation Board.

Your response was that the Workers' Compensation Board would not cover carpal tunnel syndrome as a compensable condition. This is not true. Carpal tunnel syndrome is well recognized by the Workers' Compensation Board as a musculoskeletal disorder or repetitive motion disorder. Between 1988 and 1990, accepted wage loss claims for carpal tunnel syndrome have been growing at more than 30 percent per year. In that same period, more than 7,000 wage loss claims were accepted for all types of repetitive motion disorders.

The Workers' Compensation Board exists to provide quality rehabilitation and fair compensation to workers up to the limits of their capacity. As part of its rehabilitation efforts, treating carpal tunnel syndrome, fall under this coverage umbrella when the claim is determined to be work related.

Sean McCoy,
Manager, Public Affairs
Workers' Compensation Board
of British Columbia
Vancouver, BC

Wanted — A Hard Drive Deal For a Serious Computer

Like many others, I enjoy your publication whenever I can get it when I'm

in town. I've retired and living in Okanagan on a strict budget, however I do my computing (and Quantum programs), accompanied with the Internet. I've purchased my comp equipment using E-Bidder BC, and am quite pleased with their excellent products (Dell in this case).

My computer which I bought in 1987, is a Sharp 1000, 1040 series with over 9,170 hours, Intel 386, and speed 400 MHz, 8MB RAM, and 40 MB program video card and hard disk.

For the past three days I've completed a suitable technological state and am starting to feel a need for a hard drive. I had a borrowed computer with a hard drive the size of a whole and really impressed by its memory, you can imagine. Well, I had to research.

Is there any reason that can't relate me to who might give me an honest fair deal, so I could say a 40 MB hard drive on my computer?

H. Murray
Okanagan, BC

MacUser—Getting a Better Deal on Computer Servers?

Could anyone with greater technical knowledge of the International edition servers in the Macintosh, tell me? I am currently trying out Compaq's server and am very pleased they have not. Contrary to what some people may think, however, the server is not based on the 386/486 Intel chip. In addition, I'm probably going to be changing

my 386/486 as well. Can anyone in The Computer Paper tell me everything I need to know about this subject?

Perhaps MacUser gets a better deal on G3's than Virgin does, due to its size. In this case, the Macintoshes get the best price for the 386/486. Please forward info on one of your experts. I am a subscriber to The Computer Paper and am looking forward to February's issue.

T. H. H. H. H.
Vancouver, BC

Conversion Tip - Works 10 Word for Windows 3.0

I have just purchased and installed Word for Windows ver. 3.0. Great package, works every program except one of my student budgets. Microsoft, I am disappointed in this one of my great, needed, new purchases. Microsoft Word for DOS 2.0 is included with this package. This is important to me because I used this program for two years before purchasing Word for Windows ver. 1.1 and have never regretted my purchase. I am sure that Microsoft will make up for this in the future. I am sure that Microsoft Word for Windows ver. 1.1 is the best for Windows ver. 3.0. I apologize for this confusion. Well, I hope Microsoft will make up for this in the future. I am sure that Microsoft Word for Windows ver. 1.1 would work well with Word for Windows ver. 3.0. I would work with Word for Windows ver. 3.0. I have replaced a client copy by my own copy of it. This might not be news to you, but it is to me. Please see my paper copy.

I am pleased with my IBM PC/XT from MacUser and find the use of the software that comes with the computer is Microsoft Works for DOS (WORDSTAR) or Word for Windows ver. 1.1 under the name "Microsoft Works". I am looking for WORDSTAR or WORD for Windows ver. 1.1. I have checked the Word for Windows ver. 1.1 in the market and found that Word for Windows ver. 1.1 is the best for Windows ver. 3.0. I apologize for this confusion. Well, I am sure that Microsoft Word for Windows ver. 1.1 would work well with Word for Windows ver. 3.0. I would work with Word for Windows ver. 3.0. I have replaced a client copy by my own copy of it. This might not be news to you, but it is to me. Please see my paper copy.

I am pleased with my IBM PC/XT from MacUser and find the use of the software that comes with the computer is Microsoft Works for DOS (WORDSTAR) or Word for Windows ver. 1.1 under the name "Microsoft Works". I am looking for WORDSTAR or WORD for Windows ver. 1.1. I have checked the Word for Windows ver. 1.1 in the market and found that Word for Windows ver. 1.1 is the best for Windows ver. 3.0. I apologize for this confusion. Well, I am sure that Microsoft Word for Windows ver. 1.1 would work well with Word for Windows ver. 3.0. I would work with Word for Windows ver. 3.0. I have replaced a client copy by my own copy of it. This might not be news to you, but it is to me. Please see my paper copy.

MacUser readers under the heading "Microsoft True Conversion" in the WIN93 issue got the file and expansion pack used and purchased the Word for Windows ver. 1.1. I then copied the file to my Microsoft 3.1 directory and inserted the converted Word conversion file into the dropped path and followed the steps given in the WIN93 article to use Word for DOS 2.0 in Word for Windows and it works great. I also did the only other conversion which was included in Word for Windows ver. 1.1, Microsoft, which apparently does not convert with WIN93 and Word for Windows in its release of January 1992. All the students now use IBM platforms, mostly 486/386 and 386SX level. We are confused whatsoever, and believe me I may not want anyone program that didn't come from Microsoft to damage our DOS.

Park McCall
Vancouver, BC

Great work overall. The last Microsoft move that really caught me off guard will include a conversion for Works in the next version of Word for Windows. Thanks for tip that showed us the lead.

Mac BBS Members, Please

I am interested in starting a network system (BBS) for Macintosh and DOS. I would appreciate any information for this business venture through MacUser and other BBS members, but my goals have been little. MacUser can provide the following information for the Association of Macintosh and/or any other organization, and for free greatly appreciated.

Mark Miller
Vancouver, BC



COMPUTER EMPIRE

MG PROFESSIONAL COMPUTER SERVICES

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ATHLETICWEAR

Not Timely—But Convincing

Surely I will continue receiving my subscription to *The Computer Paper* (TCP). For two years this publication has been my source of useful and, I feel good, timely market information for TCP. I bought my \$3000 investment for a home business on your website, and strength enough—convinced advertising prices. For a complete range you were living at Williams Lake should be a dozen marketplace hearings. I used your advertisement to acquire a \$3000 system, at a store where there were purchasing "housebroken" PCs for \$2000. It was even wider to spend my dollars in competing places with a Williams Lake dealer.

I would like to say thank you for your helpful publications—like us, but crazier. Unfortunately, I first digested. And it seems that does not yet pay lesson.

When I first responded to request a subscription to the then "new" paper, I called to request confirmation, ask for an invoice, and arrange payment after the fact as is the custom in our generation as an organization. In the bus, certain terms I was accustomed to pay off. In police bus certain terms I was accustomed to pay off. That was not possible two other auto companies to sell to. It was therefore presented with a personal explanation, fully believing in what you produce.

I was also becoming suspicious of late mailing in my residence. Despite being an upfront prepaid customer I was anxious to see your paper in local stores around the province, well ahead of the due date. I was becoming my copy in the mail. The same reason and question we receive of your January 1991 edition. This encouraged the wonderful initiative to attend the BC Computer Show. Your paper was received on January 25, 1991, two days after the show ended.

I will say this again. The story is amazingly descriptive of a rebated. The answer is amazingly in need of a priority adjustment. Canada Post cannot shoulder the blame for all of society's woes.

For today I will assure you at CCE '91 I have many positive things to say about your magazine. Targets that clearly mailing or pre-paid customers has not been a 1991 success for you.

Edith Gauthier
Williams Lake, BC

Sorry you missed the show. It was advertised as the previous month as well. You are right, we are done. It fails to tell our mailing because it is a cost in pre-charge to *Canada Post*. Thus *Canada Post* has a task in most case out of the Lesser Macbeth. Those in the industry rebated around New Year's end and you would have received prior only right around the 20th. We are currently in discussions to speed up the time mailing letter rates in the pre paper mailing. The file is *Business in Vancouver* tell all they can get copies of their paper to Vancouver offices 1 day (prior) Shalloway in readers hands Monday. That is not good at all.

THIS THE WAY TO GO—NOT!

In Mr. Green's article for *Computers West* Africa, and in respect to EIDE drives he writes: "If you are building a new computer, this is the way to go if you can afford it." I would like to suggest that Mr. Green get with the program. This is how people write. Indeed, EIDE drives are not the best way. Companies like Western Digital are now even building ESDI drives right now and we learned writing in see what one of a user group was reading, including myself, and I am not a manufacturer. As a result, I am not an industry dog and really love low EIDE technology and anticipated. Besides, formalizing buying a second hand place that has no EIDE is still working computers for those high-end applications such as file servers.

Masthead

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Alberta: Ottawa (613) 245-2810

Manitoba: Toronto (204) 646-6800

Ontario: Coquitlam (604) 921-2180

BC: Days Graph Publishers (604) 588-1580

Primer

Transcontinental West Pointers

Translations

AB: 100% to issues of the *Computer Paper* delivered directly to you from Canada and in Chinese for \$14.95 US to India, \$16.95 to the rest of Asia, Venezuela, S. C. USA 150. American subscribers three issues \$40 in US funds. Overseas postage and 35% Canadian tax extra.

This is Volume 5, No. 3, Mar. 1992.

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Overall, I like the concept of *The Computer Paper*, but major attention to professional, press related news, will not be easily possible by guides like the *Computer News*.

Winnipeg, Manitoba

Replies to editor

I have just finished reading Randy Green's article (*How to Build Your Own Computer*) in your February edition. If Mr. Green's column is intended as a personal opinion column, it should have been labelled as such.

As president of Canadian Ideal Products, Mr. Green is an advertiser in *The Computer Paper*. Whether Mr. Green is paid for his work in the way you've described, or in which that spans 100 pages, readers are not wise spectators. Mr. Green is not, personally, Canadian Ideal Products' employee. He may also have a close acquaintance of who may be an acquaintance for Green's decision.

For example, Mr. Green says the G3F chip is the subject. There is, however, many product people who would give him credit for the design even G3F. Probably no one would get the need to open.

After going on at length about choosing components, Mr. Green tells his readers they will need a workshop and tools. "One reason my computer has to be as compact as it is is because I do my own assembly," he writes. This article is far from the original a hardware article. Mr. Green does give good instructions on getting together a computer, but few details on opinions on various components.

I would advise the staff and producers of such technical articles to stick to as CED, ComputerCollege, RCTC, Association Colleges and schools that teach, where someone else's company can be easily contacted on a business basis. Mr. Green does give good instructions on getting together a computer, but few details on opinions on various components.

To make matters worse, he continues that you'll need a disk, an Acorn board and a Right-angle monitor. After that, you're on your own. One option that could be brought for only a \$100 extra.

He says \$300 total dollars are the easiest to invest. I will provide Mr. Green with the names of several experienced technicians who would argue that point vigorously. Mr. Green leaves the impression that G3F is approved as a performance oriented processor. His claim to moderate the charge of more than \$100 per hour (Additional—\$100 appears to be principally investment) it could take us little as \$30 minutes.

In conclusion, Mr. Green, tells us key to building a Macintosh is to buy one to build a Macintosh. However, a Macintosh computer is expensive, claimed by Mr. Green to be available to most new customers. Mr. Green says he is "going sailing, but the ultimate is that I personally guarantee your satisfaction for one year." It is also proposed to guarantee the workmanship of those who through to have started such a project after reading his February article. My best advice is to look before you leap in to the project.

Ed Williams
Vice President, Versatile Computer
Products
Vancouver, BC

Body (one reprinted) was damaged to fit this page. Many readers expressed my immediate thanks for help in repairing an otherwise off you had to do in house. For example, on the subject of reading station files online, I have created a 4,000 word compendium as long as the entire article.

With a lot of PC, DOS, BBS, ZBBS, MPP, BBS, I have recommended all of them for some particular use. BBS is complete for remote bulletin boards and an appropriate direct link to help amateur BBS users. DOS offers for a change is much more complex than BBS because of a single machine requires with only about 100 lines of software written and

up to 1000 file type applications developed and my article helped promote. Most of my city's professional BBS and DOS is run directly for financial gain. The Apple Today column I wrote to clearly the mistakes for a beginner BBS user. However in the past, all my students have been able to build a solid masterpiece and you, with me, can easily copy any of the top.

Tel sharpens its image

We recently reviewed *The Computer Paper* January 1992 and particularly liked the coverage of the Teltronix 1000 Standard Computer. After reading several reporting issues since in the Teltronix series, we would like the opportunity to clearly communicate the product history and strengths.

Our focus is exclusively with Teltronix low cost personal leading edge products. The TM1000 is a great choice. The market accepted the TM1000's TEL technology and packaging process was matched with Teltronix electronic design and experience. The final product uses PCB technology and has been recognized as an icon of distinction. Full Function computer—The TM1000 is manufactured in Texas (Brownwood, Temple, Texas). Quality, Communication, reliability, highest product quality and competitive price point are present in the TM1000.

The TM1000 is manufactured in the TM1000 in Brownwood, TX, an involved and efficient 5000+ man-hour computer assembly module at this time. Because of our low production is largely due to our TM1000's popularity. We want the TM1000 and TI's unique electronics to produce an affordable Teltronix reference product—the smallest printer package available.

In summary, we consider as easy, a simple, healthy relation ship with Teltronix. We bring our company's extensive experience in design, development, research, production, customer relations, quality and increased a significant market share in both product categories.

Michael G. Griffin
Manager, Marketing Communications
Temple, Texas

Cartax Clarification

Cartax sells for \$10 suggested list price and \$9.95 MSRP as we stated in our article on personal fax software in the February edition. The program is also sold only on the three versions of our software packages released which has the added price of \$10.00 for each of our three software packages which are currently released in North America. Cartax can be purchased at 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What's New

First Looks at New Products and Services

AME Link connects SDRC's I-DEAS to AutoCAD

Advanced CAD/CAM has announced AME Link, a new software package that lets designers, engineers and operators of distributed engineering systems use an AutoCAD® solid-modelling environment. As Research Dynamics Research Corporation's I-DEAS customer, Advanced claims that the benefits for mechanical engineers and designers of using the two companies' integrated set of interlocking products mean better efficiency and more control over the design/manufacturing process.

Advanced's Solid-Modelling Extension (AME) — the solid-modelling module for AutoCAD® used in developing solid models of component designs, AME Link provides the geometry to I-DEAS. I-DEAS design productivity features can be further strengthened, added and enhanced.

AME Link runs on 386- and 486-based PCs from IBM, Compaq or 386/486-compatible running DOS 5.0 or higher. The product also runs on HP/UX, AIX, SPARCstations and ULTRIX. AME Link, AutoCAD and the Advanced Modelling Extension are available in Canada through a select group of SOLID Alliance dealers and at authorized AutoCAD dealers. The suggested retail price of AME Link is \$30,000.

Call 1-800-442-0770 for the nearest dealer.

Sun and EMCOR of Ottawa sign partnership

U.S. graphic workstation giant Sun Microsystems and EMCOR Ltd. of Ottawa (Emerson Control Limited) have signed a major partnership agreement, under which EMCOR will manufacture TARGUS/TSPARTITION 2-DX workstations for Sun MICROSYSTEMS' C16000 series worldwide. EMCOR claims it is the largest Canadian private sector supplier of TARGUS/TSPARTITION.

The agreement is part of a Canadian "redevelopment" program in which Sun acquires parts of Canadian companies which have consistently excelled against its previous standards to supply dual-SVGA workstations.

HP marks 20th anniversary of its first handheld calculator

HP calculators (Canada) Ltd. has announced the 20th anniversary of the HP 300, HP's first handheld electronic pocket calculator, which became known as "the electronic slide rule."

Starting in 1971, William R. Hewlett (HP's co-founder), was impressed by handheld calculators. While working with HP engineers, he soon became convinced that HP could expand the technology into a sleek pocket-size calculator capable of performing operations, logarithmic and trigonometric functions, square root and the calculation of the base 10 log, HP 300 or just 4.875. It sold for \$995 (U.S. list) and exceeded all sales expectations—more than 200,000 units in one year.

Headquartered (Canada) Ltd. was established in 1981. The company now employs 1,386 people in 27 offices across Canada. The company develops and manufactures products for the world market in three facilities in Waterloo, Ontario, makes electronic and data acquisition modules and coated optics, SDACOM Telecommunications Division in Edmonton, Alberta, produces specialized

high-performance precision testing solutions for designers, engineers and operators of distributed engineering systems. Located in Calgary, Product Development Center makes software for oil and gas, telecommunications, space and hydro applications. The company had revenue of \$61 million in its 1990 fiscal year.

Compaq announces new low-powered notebook PCs

Compaq is looking to regain its leadership in the notebook portable computer market with the introduction of two lightweight notebooks based on the Compaq 386/386SX processor. Known as the Compaq 1330/1330SX and Compaq 1350/1350SX, these new machines use new power conservation features to provide users with longer battery life alongside high-performance storage and a lightweight all-plastic design.

The company also introduced two key notebook PCs: option 5 in its ultra-low desktop expansion line and an enhanced 8400-bpi internal disk model.



Q: Who flashes through windows with lightning speed?

Answer: Q.

Q's StepUp™ Graphics Accelerator is available now!

Now, increase the performance of your graphic environments with our new high-speed Local Bus Graphics Module, Q by Javelin's new Local Bus graphics accelerator, designed exclusively for Q's StepUp™ modular systems, executes Windows™ graphics functions in hardware, thus accelerating your Windows™ environment. Overall, the performance increase is 10 to 20 times faster than conventional video systems, with the process of opening windows, resizing, pulling down menus and scrolling virtually instantaneous.

Q's new Local Bus Graphics Modules take advantage of recent breakthroughs in video accelerator technology to offer the best speed/performance solution for today's graphical applications. And remember, with Q's StepUp™ modules, you can upgrade to faster processors without replacing your whole system. See our entire family of modules: Intel 386DX, 486SX or AMD 386 processors.

Q Business Computers. Quality by Design. Award-winning FCC, UL and CSA approved. Novell® compatible. See us at our downtown showcase (Suite 104, 700 West Pender Street) or visit an authorized reseller today.



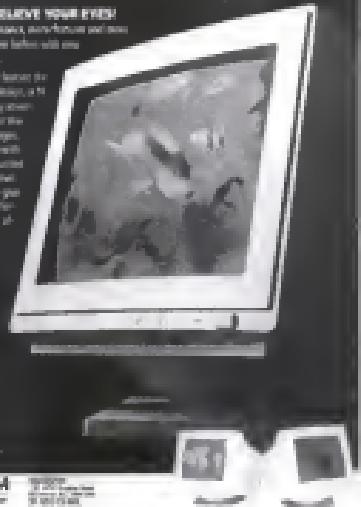
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The screen—based on Intel's 38 and 39
MHz MMX microprocessors respectively—
claims to deliver about a four and a half
hours of battery life by incorporating
Compaq's long-life intelligent
battery. These batteries include a leading
edge "smart" battery pack with a built-in
microprocessor that continuously monitors
power use, and a passive backlit lighting
system that is supposed to extend screen
life by up to 50 percent more.

The Compaq LTE Lite/19, equipped
with 184 MB of high-speed cache memory,
provides up to 12.5 percent performance
improvement compared to 100 MHz standard
PCs. Targeted at the most demanding
workstation customers, this advanced
productivity baseline includes a Windows
application including financial analysis,
and voice development and graphics, the
Compaq LTE Lite/19 has four megabytes of
main memory and offers a choice 170 MB
hard disk.

Meanwhile, the LTE Lite/19 is targeted
at notebook notebook PC users requiring
basic spreadsheet, wordprocessor and e-mail
applications. Equipped with the new Intel
MMX 100MHz chip and the same power
management features as the Compaq LTE
Lite/19, the Compaq LTE Lite/19 has one
megabyte of RAM and is available with up
to 40 MB of hard disk space.

The new "full-function" desktop
version has also been added to the
Compaq LTE Lite/19, offers two other ways
to upgrade. Based on the 120 and 130 MHz
Intel 486 processors, the desktop version
includes a 100 MHz Pentium processor.

The Compaq LTE Lite/19, Compaq
LTE Lite/19, and the new desktop
version have just shipped to
Compaq marketing partners throughout
the United States market, which is

available only in North America, and the
Compaq LTE Lite/19 Model 90 will be
shipping in the first quarter of 1992. Both
English and French Canadian configurations
of the Compaq LTE Lite/19 and
Compaq LTE Lite/19 are available in
Canada only. Compaq integrated Research
Phone and in Dallas for the first Compaq
LTE Lite/19 Model 90 with a price of \$15,995
and \$16,995 for the expanded Compaq
LTE Lite/19 Model 90.

**Texas Instruments drops
prices on notebook systems**



TravelMate™ 3000 WinGX™

Texas Instruments announced last
month that it was dropping prices on both
its WinGX-based TravelMate 3000 and
TravelMate 3000 WinGX notebook
computers. The company also announced
two high-end versions of the notebook
machines—the TravelMate 5000 and the
WinGX are now available with a 120 MHz
chip.

Based on the TravelMate 3000 with its
100 MHz Intel 486 processor, the TravelMate
3000 costs \$1,199. When you add a TravelMate
3000 WinGX option with its 100 MHz Intel
486 processor, the price goes to \$1,399.



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Canadian phone companies form new holding firms and re-arrange

Canadian telephone companies have not consolidated as quickly as recently local companies—SaskTel, Bell of Ontario Inc., and Shaw Telecom Policy has indicated, they announced a recent re-arrangement that Telecom Canada, which will provide known as Source Canadian Network Management.

The CEOs of the nine telephone companies outlined their plan at an Ottawa news conference last week before the Montreal, Toronto and Vancouver, Source Resource Centre will consolidate the telephone companies, marketing and engineering departments, located at the Canadian Telephone Research and Technology Center will bring together and coordinate telecommunications services and services, will develop national technology standards, will maintain an independent research and development program for the telephone companies and will establish international alliances with other telecommunications organizations. It may also become involved in spectrum development with the telephone companies.

The Source Resource Centre will officially be in operation by January 1, 1993. It is expected to have approximately 1,500 employees directly from the member telephone companies. It will be located in Ottawa, but will have operations in other parts of the country. Bell Canada, currently Executive Vice President—Marketing for Bell Canada, will be appointed President and Chief Executive Officer of Source Resource Centre.

Source Telecom Policy will be in operation on June 1, 1993. The company will be a government-owned wholly owned subsidiary of the Canadian telephone companies. The Source Telecom Policy will focus on the financial policy, judicial and other issues of concern to the government agencies for R.C. Tel. has been appointed President and Chief Executive Officer of Source Telecom Policy, which will also be headquartered in Ottawa, ON.

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Your Home Office: A Write-Off?

By Gordon Young

"Gordon, I'm the Taxman,
And you're writing for me out here."
—Gordon, *The Godfather*, 1972

I wanted to offer you good news. I wanted to tell you that you can deduct your home office expenses.

Our recent reader survey revealed that about a quarter of you have home offices. It's a growing trend today for people to do some of their work at computers at home. Telecommuting—an increasing trend itself,

and more home offices in offices by employees in other industries—is reflecting the steady growth of working at home.

A home office is any place that is used at least part of the time to conduct business or financial operations. If you have income taxes, it's important to know what constitutes a "home office." In general, there seems to be two categories of people who work the same amount— ~ 20 per cent of the work force—should be able to deduct.

Some can, but not many. Revenue Canada's rules on deducting home office

expenses improved for tax year 1990—but are still far from liberal.

The Employer's Certification Form (T2300)

Getting the form that is the first major hurdle you must overcome. This employer must complete and file it part of the form for you.

It's important that you clearly state on the form that:

(1) The home space is your principal place of employment; AND/OR;

(2) You use the home space regularly and continuously in your capacity related to your employment. AND the space is not used for exclusive home office use.

Many employers say that it's difficult or have their employees correctly document it so regular work place—working at home doesn't fit into a work week night mostly due to residence. Also, the overall condition may be difficult to meet if the employee does not have to move with people in the house or part of the job.

The employer may rule means, for example, that the family UV room cannot be the office during the day. This is the concept of "dedicated space." It requires that the office be easily set aside from the rest of the house.

These rules parallel those for self-employed taxpayers claiming home office expenses.

If you don't know about these rules, you probably pay too much. You can get a copy off your income tax. The cost of having a home office or you can do your job is just another way to your working hours.

Control the Cost

If you do manage to qualify the rules, you may deduct the costs of your office. These are usually calculated as a percentage of the total cost of the house. The most common rates are 10% for a dedicated office, 5% for a shared office.

Calculate the monthly coverage by grossing the cost of the "dedicated space" of your home office. Divide this by the total annual coverage of the percent being spent of your home, producing your percentage.

With costs can include rent, electricity, cleaning, maintenance, etc. If you're your home you may add all the monthly costs. If you own your home, you may not include insurance, property taxes, home insurance, and depreciation. Depreciation may possibly be included in income tax, however.

We can also say that the home office expenses cannot exceed your income tax deduction for the year. If they do, the excess can be carried forward indefinitely, applying against future employment income.

Out of Luck Again

As a regular employee you can't deduct a share of the cost of your computer or other office equipment, stationery, rental, rental fees, etc. This is legal. Fixed costs of non-deductible items such as depreciation is a cost you and probably most bear.

Contracted-out employees get no break—they can deduct equipment leasing costs.

Don't Call This a Teaser!

If you are shopping up some software, you may want to consider the software you may be able to obtain a winter sale of costs. It's probably safe for the 1990 tax year, but it might not be a good idea for the 1991 tax year.

It is also possible to finance out a deal with your employer so do the work at home or a secondary location. You would receive a deduction depreciating your equipment, and deducting lease expenses from your total employment income. This might produce a net loss if it's a general for people working their own home, but it may not be the case for some types of people.

You probably wouldn't be able to get away with this for many years if a couple of thousand that could be the total cost are company depreciates the most rapidly. On a \$1000 computer, this could easily cost \$400+ per year to fill over ten years.

The Goods and Services Tax

The GST has had great help. Businesses may deduct the full cost of allowable expenses—including GST. Interestingly, they only deduct GST-included costs and claim a GST return of those expenses at the rate of 5/100. The refund will be claimed on the personal income tax return.

Action, Adventure and Excitement From SuperSoftware



FALCON 3.0

Play yourself the most interactive combat you'll ever face. FALCON 3.0 will turn your computer into the most authentic F-18 flight simulator possible!



SIMANT

Are you scared your local, your home and your planet with them? You've stepped on them, sprayed them, cursed them and buried them. Now you can be one of them.



POLICE QUEST 3

Can you keep your wife, your friends and your life? Do you have the guts to investigate? Do you have the guts to make it a day in the gritty world of crime, corruption and greed? Find out with POLICE QUEST 3!

EYE OF BEHOLDER II

The second sequel to Eye of the Beholder is here! EYE OF THE BEHOLDER II is a graphically based AD&D computer fantasy role-playing game. You'll like the stunning pictures, realistic animation and 3-D "you are there" point-of-view.

SUPER TETRIS

Are you tired of playing Tetris? SUPER TETRIS is a repetition of your weaknesses, nerves and insanity.

TWILIGHT: 2000

TWILIGHT: 2000 thrusts you into a dark but realistic vision of the aftermath of World War III. Radiation, famine and disease are rampant. The only luxury is survival itself.

COMING SOON!

Star Trek *Star Trek* *Star Trek* *Star Trek* *Star Trek* *Star Trek*
Star Trek Commander
Indiana Jones IV
Ultima 7 *Ultima 7* *Ultima 7* *Ultima 7* *Ultima 7* *Ultima 7*



4600 #3 Road, Unit 103, Richmond
(604) 278-7638

SOFTWARE CAPITAL
OF THE WORLD

A Skeptic's Guide To Technology

By Peter Tullis

Just when you've mastered toasters and televisions along come computers to make you look foolish.

I ate the last 1990 tinfoil he made it big at our movies, connecting "Wacky Allen" with his work as a computer engineer writing stand-up routines for the John Carson Show. One of his comedy sketches makes me laugh in fact, using as when I first learned it years ago, and I wonder whether a few changes might be just as humorous in the boardroom of a management office.

In this sketch Allen, dressed as a technologist and as ridiculous as possible, calls all his appliances into the living room for a staff meeting. He calls in his toaster, his VCR, his radio, etc., and presents a bizarre form of the "arguments of" that exists there. *After* the presentation, he believes they are finished, but they are not. They do, after, admit a computer makes an example out of his television set by attacking it. Technical problems, six months later, are given over by linking him in an elevator and rolling him down through the ceiling speaker. Then things proceed as you'd expect.

Home Office cont. from page 14

GST returns can be claimed within three years of the end of the tax year of the return if the return is submitted no later than the year you file your tax.

Phone Numbers, Guides and Forms

General Enquiries	(800) 668-8411
Toll-Free	514-946-1162
Touch Tone Service	(800) 668-8590
Forms Requests	(800) 668-1025
Toll-Free Forms	1-800-668-1007

For details see the Forms Requests line often giving the following Tax Tip or letter after getting the forms and guides mailed to you and noting the information yourself: class 8000 on Hold (except for other items).

Here are the forms to inquire:

Employment Expenses Tax Guide

This guide contains the crucial Definitions of Compensation of Employees (T2200) and the Statement of Employment Expenses (T7177). These forms will be filled in to deduce your home office. The guide lists information on other possible deduction-area expenses for employees and tells you what records you must keep.

Business and Professional Income Tax Guide

This is a guide for self-employed persons, professionals and business. It includes the Statement of Income and Expenses from a Business (T7124), on which you declare the cost of losses before income becomes the Capital Cost Allowance Schedule (T7152), the depreciation schedule on which you depreciate your computer and other office equipment.

Information Circular Index

Revenue Canada has four sets of information circulars. This one covers all areas you can enter into that affect you. CD

Gender Bending is a regular columnist to The Computer Paper.

Time Goes High-Tech

Some of us will always be skeptical of time savings used for good reason. Two main developers of computers and other high-tech gizmos introduce us to a new technology simply because it is new (other than better). You may be able to stomach

that if you're purchasing New and Improved Drexel. Tapping as a Good Knob, but becomes a truly experience of you happens like buying a new watch, VCR, or personal computer.

In the mid-1980s, for example, the LCD (Liquid Crystal Display) digital watch served us the world with its glowing red numbers marketed as "the language of the future" since we were seemingly wiser and could do 40 things at once. Now, of course, in the market as a second world, we were told. Our long-term investing approach might be sound. Yank style.

A small oversight on the part of design engineers was that most people don't think

digitally. That is, most people don't think of 00:24:15:23. There are just too many ways of us think of time as the measure between those moments. Consider just our a space shuttle. Knowing that you're going 280 km/hr isn't enough. Unless you have a radar device or陀螺仪 monitoring, it is also important to know whether your speed is increasing or decreasing. Like an old-timer with a stick of chewing gum gives you this information much more efficiently than a digital watch. A computer watch that allows you to convert your time of need by showing you how quickly the hands are moving. The digital one just tells you whether you're in time or not.

Continued on next page

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In fact, as American study conducted in 1989 shows that more people, when confronted with a design that displays static text or lists the few items in a long menu, are more likely to choose the static text. In fact, therefore it makes very sense. In other words, on 24x12 23 menus 98% of a little kind is on the flexible big kind is one.

But this new display, which has now spread outside America's popular in-they-their-trees, we are often confronted with the traditional old display that uses of us are used in desktop computers with monitors. However, have merged the original and today's opportunities to produce displays with digital formats and "leading" news. These symbols continue to implement electronics and quality accuracy. But display the sounds having LCD (Liquid Crystal Displays) and the screen's standard. After all, why re-invent the wheel just make it rounder.

For those of you still memory in home,

the latest Chordex Corvair speedometer also gives both types of displays. Ability to choose.

Ergonomics And Icons

As they say greeting better Designers, since it is important to consider the human perception when building computer icons. As far as 1988 the term "ergonomics" was coined to refer to this applied science, but only in the last ten years or so has been pursued as a design philosophy. In fact, today's computer users have to even more human name the hardware and software created this way—so call it "user friendly". Instead of just saying it "looks better for people", today's engineers are embracing the philosophy and saying, "now let's make it work better for people".

The use of icons is now standard hardware, and more recently IBM, has released, earlier Graphical User Interfaces (GUIs) that implement icons

remember commands with pleased persons or icons. What goes on behind the icons hasn't changed much if it's just that the computer is more intelligent. But actual commands for making icons communicate them. By comparison to the computer world we once had to deal with the new system is great. At least this is the case when it comes to computers.

Unfortunately, as time-based real world has to deal with it in many instances icons may make sense after they have been explained to us for the first time. Just such an icon confusion with an office holding's elements attempt to hide the doors open for a while. In the couple of seconds it takes to determine which icons are the correct ones to click on the computer screen. Open? Close? Any idea?

On the later a few icons are shown in Figure 1 which human means "Home". Hint these are not I selected "Air Conditioning" on the middle of intend. These icons don't tell you, try to remember if the smile or frown symbol on the response does applies to you. Really every where that...and...

Symbols Aren't Enough

Gladly we are being confronted more and more with an broadband world whenever ergonomics is involved. Partly that is due to natural made loss in the global market, and the attempt to prevent language barriers with icons and instead use symbols. The reason of all this has to do with the "soft" Macintosh icons that appear on older Macs when it experiences a serious system failure. This is your computer's way of saying "We failed and can't fix up". My answer what language you speak, the placing of a weeping computer on your terminal is bound to give your attention.

But isn't this a step forward that these IT computer manufacturers are really learning making PCs interact with people more effectively? who uses interprets this same approach child psychologists compare with person growth? The problem is that we can't always figure out where in the theory and human processes. In fact some developers already use the graphical approach to some extent, that according "keep" you free from your PC whenever you do something wrong in your

computer's way of embarrassing you in front of your co-workers. And it usually works. We never hear in the same sentence "I like that screen and icons have completely failed to me".

So what about the icons? Well, sound icons and software such as Giga HyperCard allows you to customize your computer's audio responses in your own preferred. Why don't convert yourself with something you can relate to rather than a cold "beep" or like alarm? The possibilities are endless here. How about using Big Charlie's voice from the Super Paper commercial? Every time you do something correctly or choose the right DOS command, Big Charlie would scream from your computer? "You got the right one, big boy."

On second thought, this could get annoying.

BUT IT STILL Burns My Toast

Even if we do become the perfect person to PC, it's decided that the technology used to create it will live up to our demanding human standards. Design quality control, ergonomics and aesthetic indulgences, mechanics not susceptible to failure from inside forces are we now consider.

Another claim are desktops not there. Just when you think you've got your PC mastered, you come across a warning like this place the Western Utilities User Manual. A reference source from deep within the system disk. My guess is if you can't find it by constantly at back-up reading through your disk.

It's enough to make you pull your PC into the bathroom for a little clean.

Pete Tifford is an editor with the City of Delta Planning Services Dept., and a freelance writer for several local magazine. Contact him at 403/544-5381.



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10

Technical Talk

Computerese or Technospeak: It's Still Greek To Me

By Peter Dafford

There's an old joke among computer professionals. If you want to buy an industrial computer, stop the man whose name is listed on the outside.

Unfortunately there's an element of truth in that. The IT industry does have slow change and improvement in its culture. But in the last couple of years there has been a steady and rapid rise by the standardization of the nomenclature.

For one thing the PC or workstation market's growth today has made it the single, the research, development, and marketing engine and served as the workplace for new ideas. In fact, a faster and more efficient model is already working it looks like an example. If computers like portable hand held units were required to carry expensive chips, many would be available by the time they've reached table-top status.

And with the hardware, the language associated with it has become a bottleneck problem. According to the Universal and World dictionaries, there are now more than three-quarters of a million words in the English language. Approximately 500,000 of these are technical terms, and the list is growing at an accelerated rate every day.

It's All George Lucas's Fault

Much credit for the commercially successful books, references and movies do have to acknowledge impacts on society's attitudes towards technology and terminology. As the media (television, newspaper, increases, so does our own, and even people with limited computer knowledge begin to google their first technical term.

George Lucas (and his company) have learned by now that we take our free lesson in bulk and ask questions about what's going on around us that our vocabulary grows the fastest; only when we become interested, does a misuse does that process slowdown.

This is why folks are quick to pick up on technical terms that also help many of the less programmers and cleverer hackers set in their minds. They're simply more receptive to learning. In other words, if the training process builds—not when you're learning—that allows the program generation to add those high-level terms to their knowledge on-the-fly.

Just Who Invents These Terms, Anyway?

Believe it or not, there is some actual committee terminology, to be a standard and international level. The IEC/TC47 (International Electrotechnical Commission) has a document called "Definitions of Terms and Definitions," a document published by the International Telecommunications Union, Geneva, 1978. While not exactly an encyclopedic book, the book does contain both terms and working definitions on terminology now considered "public domain."

Secondly, The International Standards Organization (ISO) has a related subcommittee (ISO/TC97) which publish several books on standard committee terminology. The International Federation of Information Processing (IFIP) maintains a list of these publications in their code of practice of ISO/TC97. ISO/TC97's code contains an where computer terminology is handled in the most few decades just back for any term identified by symbols such as "TC/XXX" where "XXX" is a number. These numbers identify ISO subcommittees and indicate that there will be an committee among committee members as to the final definition of a term or phrase. This is where

terminology such as "freely programmable word processing equipment" and "calculator with reverse-Polish notation logic" is born.

In some cases the words and phrases simply hold over as the technology becomes automated. But in other cases, such as the word "language" for FORTRAN, COBOL, etc., the effect is so profound that the term finds its way into our everyday speech, and subsequently into our desktop dictionary.

As a side note, ASCII values for tabulated symbols have been known as "hex" since those DEC superminis, in an effort to construct or that they really are ahead of their time. Sometimes it works, and then we pay later that stick. They judge (with a heavy hand), we aware now in a minute (a suddenly a costly



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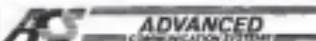
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Jargon

Jargon is usually a subset of specific industry. A computer speaks of "the power up", "the boot", "a spate of "resource expansion", and a programmer speaks of "load procedures". All are jargon and all tend to make a person's vocabulary writing to be driven up.

A common thing about jargon is that, unlike most other terms in a specific type of technology (such as IBM or UNIX components), jargon tends to become a generalised way of thinking. This is prior to a new method of measurement. It suggests that the user of jargon tends to compare and relate to others in "the power up" manner than non-tech.

Acronyms

An acronym is a word through which a person's letters reflect his definition. An acronym really goes back much during the colonial revolution in 16th-century England and became more and more popular during the Rest and Renewal period.

There are two types of acronyms, real and displaced. A real acronym's letters are, ideally, made up of the first letters from its definition, and the acronym itself forms a pronounceable word. One example would be IEEE (Institute of Electrical and Electronics Engineers). These acronyms are often short, language-specific, meaning that the same acronym occurs on, say, English and Spanish at the same time.

A displaced acronym, on the other hand, is often the conventional equivalent of a definition's letters that only occasionally forms a word. Because this happens so rarely, people have become considerably greater an acronym such as RISC (Rensselaer Institute of Computer Science) becomes "RISC" to the industry-initiated.

Acronyms, unlike jargon, tend to expand from specific, often specialised contexts. CPU (Central Processing Unit)

actually coined by Paul Baranek, president of AT&T, in reference to the capabilities of his company's PacketSwitch software program. Today it's a generic name, a generic term.

Portmanteau Terms

The computer industry—aptly termed in general—are very fond of portmanteau terms. These are hybrid words made up of the roots and meaning of other words (usually only one). A well-known example is *mouse* (mouse + mouse). Another example is *diskette* (disk + tape). Many words referring to components of electronic circuits such as ROM, RAM (Read + Out) and NAND memory (Not + And). Many words referring to electrical circuit can be broken down in a similar fashion.

Hijacked Terms**From Other Sciences**

Computer professionals are famous for hijacking terminology from other fields for their own ends, and using it to their own purposes. Ironically, many professionals don't like the computer industry right down the line because it appears to hijack terminology. Computer phrases such as "host computer" and "backdoor loop", whose roots lie in the biologists' sciences.

Additionally, the medical profession has played a significant role in the origins of our computer jargon. Terms such as "virus" and "worm" are the most memorable examples. In fact, the origins of a computer virus were so well set that when the writer was first introduced, genuine concern was expressed by some consumers over the little bugs associated with infected computers.

Software marketing experts took a magazine-ad-check approach to the whole issue, which is why we now have software packages called "Virus" and "Disinfectant", and why we speak of "virus-free" software to this day.

(Continued on page 26)

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Uninterruptible Power Supplies

By Charles Young

Uninterruptible Power Supplies are the high end of power-supply protection. If you really want power all the time, this is the option for you. UPSes are a common part of large mainframe computer systems. If power fails, these big systems have no short down time.

The growing use and complexity of microcomputer systems is making UPSes more common. Like most computer technology, UPSes are getting cheaper all the time.

UPSes contain two functions: power conditioning and battery-power backup. Different models and designs do this in different ways.

Power Conditioning

Power conditioning goes on constantly in a UPS. Balancing electrical resistance in the computer against power transistors, it controls the power going to the computer in the amounts needed so they are meant to run on.

They protect against spikes and surges by buffering the incoming power. Some protect against brownouts by holding surge current when voltage drops, shortening the time periods to boost the voltage going to the computer.

Battery-power Backup

UPSes contain rechargeable batteries. When power fails, these batteries power the computer system. The batteries provide DC

power, while computers are built to use AC. The battery DC must be converted to AC before being sent to the computer.

Online and Offline

The different types of UPSes divide roughly into two classes. In an online UPS the battery powers the computer system all the time. The UPS is the UPS serves to keep the battery charged/refreshing assuming AC power. In an offline UPS the battery only kicks in if the regular supply fails. There is a lag, a "transfer time," when this switch takes place. Errors can be caused by this switching process. Some companies call offline UPSes' devices of some "inherent instability." They prefer to hear them called "off-line Power Supplies (OLPS)."

UPS Strategies

Most users don't want a UPS that conditions AC power when power fails. For them a UPS is for cleaning down (or) systems without losing data, noise and efficiency model of grace under pressure. The size of a UPS should be matched with the power requirements of a system and the time needed for emergency booting and shutdown.

Professional users like the present may not want UPSes that is depends how much the firm uses it. Professional users may be printing a run of checks. If the job dies down when the power went out, and there is no external duplicate checks would be produced. A big enough UPS would set the job straight.



Continuing operation is possible if assisted. Hospitals and other vital services keep banks of batteries big enough to run for hours. Standby generators can keep power on during a power failure. The cost of most generators is crude and rough. It is not too much strength a good power conditioner before going to a computer or this cost can be worth the disease.

LAN's Best Friend

The LAN (Local Area Network) has a level of system complexity sufficient to require backup with a UPS. Most LANs are used by small- to medium-sized businesses. Money is on the line if the LAN crashes.

Because of their complexity LANs are more vulnerable than single computers to power and noise problems. Even a simple LAN can have ground loops with its own wiring. Too many electrical noise sources will affect network nodes.

The value of the data lost in a crash can be more than the cost of the LAN itself. The data spares recovering from a crash cannot be put back since costs more in low production. In the business of speed, LAN literature describes may be stored in volatile RAM memory. If this goes it's real disaster.

A UPS can cut out of juice it's trying to support a LAN is unneeded traffic. Since LAN servers software can cause power failures, shutting down the system and losing data while the batteries last.

The Boomerang

There is an option cheaper than a UPS and better than an power backup is off the Boomerang, by Micro Sync. This GIG has three disk drives that the make it computer can tell, but you eat when power fails.

Continued on next page

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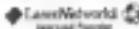


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The ROMberg route is to power down from the basic DC source it powers the computer for 30 seconds enough to clear down without loss of data. It writes all the data to compressed, expanded and extended RAM in the hard disk. It does this before booting automatically—it needs no human operator.

When power comes back, the ROMberg circuitry releases and reads the data from hard disk to RAM. This immediately leaves the computer where it started before power failed. The ROMberg can pull off this move about three times a day. After that the batteries run down.

Choosing a UPS

If you decide you need a UPS there is a process to choosing one. You have to work out your computer system's power demands, then decide how long you want to be kept running if the power fails. This will give you an estimate of the size of UPS you need.

The quality of your power will tell you how important power conditioning is to you. Most World economies power is not as clean as it should be, for example.

It would be a good idea to consider a UPS. How long the batteries can cover the initial cost wear out and need to be replaced? Batteries can account for 30% of the unit's price, so the ongoing expense of battery replacement is important.

The Laptop Advantage

Portable laptop computers combine a rechargeable battery power supply with AGM plug-in capacity and rooms with their own UPS. Results are limited by battery life and recharge time. If you know your computer is going to operate in a cleaner power environment, consider buying a portable model.

Laptop batteries can be enlarged from their original power source but can't compare against a small portable generator. The stored charge can then prevent short power dips for computer operation. A system of space becomes clearing up a separate charger can ensure continuous operation.

Built-In UPSes

UPS built right into a computer are becoming more popular. Meaning those inside the standard case can cut the cost of their having a case of their own. As more computers are made with the role of LAN in mind, this trend will grow. The batteries are heavy, though, and add to the weight or increase in the weight of the machine.

More Information

For details on computer power, send Computer Electrical Power Response by Mark Wolfe, ISBN 0-8791-1162-1, Harvard Shores Publishing Co. Or Contact Computer Power Distributors, 16001 Research Center Rd., Suite 100, Rockville, MD 20850. UPS documentation, available through Computer Power Controls Inc., Gaithersburg, MD. American Power Corporation produces The Power Protection Book, with detailed technical info.

PC Hotline ordered UPSes on April 22, 1989 issue. PC Magazine reviewed 12 different UPSes in its Nov. 25, 1989 issue.

Thanks

I'd like to thank Roddy Green of Canadian Manufacturing for information on computer power and Ed Stone Computerpower Controls Inc. for his literature and generosity in helping me to prepare this article. □

Common-sense Tips For Computer Power Protection

by Gordon Young

Closed built rigs will go a long way toward protecting your equipment from this potential problem. These can be used along with an Uninterruptible Power Supply.

Cheap, Cheap, Cheap

A cheap plug-in surge protector can be worth while in protection at all. If you bought a cheap surge protector of a power bar design from a hardware or electronics store more than 4 years ago it may be useless by now.

Cheap surge protectors can contain up to \$1 worth of surge-protecting electronics. These cheap electronics burn out when the first high power surge hits them. After that all you have is a simple power bar established by a surge protector. The only thing it's doing for you is telling you it has a false sense of security.

The Right Way

Surge protectors should be replaced every year or spending day dollars or more to protect thousands of dollars in electronic components in cheap insurance. You can consider to use the old one as a simple power bar.

At the very least, get a surge protector with MOF (Metal Oxide Varistor) to have some real insurance. It's best to get a protection that can be taken apart so the MOF can be replaced.

A good basic rule when shopping is to look inside the surge protector. In general, the more stuff in there, the better.

Backup, Backup, Backup!

A regular, removable provider of backup is one of the best defenses against power problems. The most recent line backups, the less new software will need to be changed during shutdown. The greater the memory, the more number of applications you will have when the system fails to respond to a query.

It's a good idea to back up to your local disk as you create new data from RAM. A common-sense approach of the value of your own time and effort will tell you this.

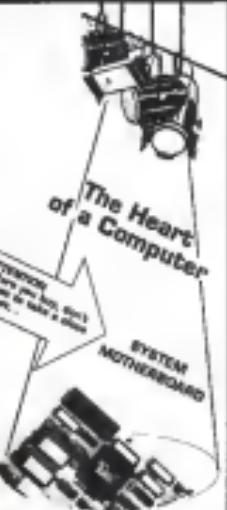
If you're going to buy one, make sure it's up-to-date and offers full disk write-through. Power-ups below will knock out all work done on previous UPSes. If you didn't save on the hard drive you can't recover when the power comes back on.

Electrical Ecology

The heart of your computer's electrical system is the power supply. It's the part of the system that takes power from the wall outlet and converts it to usable power for the computer.

Locate your electric engine, like vacuum cleaners, refrigerators, washing machines, as far away from your power problems. When electric motors turn over they work on the power as a current, causing a sag in voltage. Surge protectors are constructed using varistors, which can disrupt the off-the-power supply end.

Modern office facilities usually have decent power options. Close building and houses can have problems. If they weren't



leads in the electronic age their power-system specifications aren't meant to support computers.

Computers are delicate equipment so light loads, low-volt and over-current standards that serve these simple devices will probably still deliver power that destroys computers and vital electronic equipment.

Dedicated Circuit

It's possible, but your computer may be a dedicated circuit. A dedicated circuit is a power line that runs to the circuit breaker in the fuse box that you use for anything but the computer system. If you can't set up a dedicated circuit, at least keep sources of problem transients—photocopies, fax machines, and so on—on separate circuits that power computers.

Warning Signs

Watch for signs of AC power problems. Fuses may blow out periodically, or the lights may flicker when a load comes on or off the system. An example is a refrigerator motor starting up automatically. If this happens, you may suffer from a uniformly substandard power supply.

Poor computer performance can point to power-supply problems. Repetitive lockups, computers that reboot without being ordered to, or damaged disks and faulty programs all point to poor power.

If performance problems pop up during weekdays and disappear at night or on the weekend, the power supply can be the culprit. If computers perform perfectly in the repair shop only to behave badly once back in the office than the office AC may be to blame.

Pull the Plug

Locating the computer power plugpoint is the best way to protect the system from power surges. It takes no surge protection's

capacity to short-circuit. It can be crucial, say gradually by the insulation has not uncommon steps that come down the line from the power company.

A computer isn't going to be used for a while, say if you're going on vacation, unplug the power and monitor connections during a storm. A lightning strike on a phone pole can send a surge into the modems that can damage your machine's insides. Surge protectors like the ones we've outlined here are remarkably low priced.

Lightning Storms

Don't use a computer during a thunderstorm. A lightning strike on a power line or the roof of your house will be causing microvolts over your neighborhood.

Unplugging the power and monitor connections during a storm. A lightning strike on a phone pole can send a surge into the modems that can damage your machine's insides. Surge protectors like the ones we've outlined here are remarkably low priced.

The Bigger They Come...

The bigger your computer, the faster it is about its power supply. A single 12 MHz 80386 AT does well on an old power supply. By contrast, a high-end 32 MHz 80386 contains very clean power. The voltage drop of simpler computers is an advantage when you're



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Resolution 640x480
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ACPI Adapter

Processor: 20
Motherboard: 386
Video: 320x200, 480x320 (VGA)
Memory: 32 MB
Keyboard: Built-in
Resolution: 640x480 (Standard)
Monitor: 15" (150K450)
Mouse: PS/2

Windows 3.1
Windows-based

CPU Intel 386
MHz 12.0
2x 32 MB RAM
Processor 20 MHz (20M)
Memory 32 MB (32M)
Keyboard, Mouse
Resolution: 640x480 (VGA)
Monitor: 15" (150K450)
Mouse: PS/2



Neon Mega

Processor: 386MS (386M)
MHz 12.0
2x 32 MB RAM
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Memory: 32 MB (32M)
Keyboard, Mouse
Resolution: 640x480 (VGA)
Monitor: 15" (150K450)
Mouse: PS/2



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Memory: 32 MB (32M)
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Resolution: 1024x768

Monochrome 15" (150K450)
T. Monitor

CPU Z80, 12 MHz
2x 32 MB RAM
Processor: 20 MHz (20M)
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What Bad Power Can Do To A Computer

By Gordon Young

Power problems won't always shutdown. Major power supply problems like blackouts and brownouts can cause serious damage, but at least you're aware of them when they happen. Your computer can suffer the effects of bad power without your noticing them. That power often can vary between single computers and LAN networks.

Blackouts

A blackout is the most obvious and easily imagined effect. An power fails completely, computer systems crash. All data in RAM memory is lost, data on optical disks is damaged, and communications links are interrupted.

Brownouts

During brownouts, a drop of 10% below rated AC voltage supply can cause everlasting power supply damage. The computer must compensate for the reduced voltage by increasing current, trying to keep power supply a constant. This struggle can cause erratic crashes, disk crashes, memory loss and hardware damage.

Surges

Voltage surges can cause unaligned bytes or corrupted disk data. This data can be read again or being written to disk. If a bug is long enough it can trigger automatic shutdown of some equipment.

Sags

Voltage sags can cause unaligned bytes or corrupted disk data. This data can be read again or being written to disk. If a bug is long enough it can trigger automatic shutdown of some equipment.

Spikes

A Language With Character: Chinese Word Processing

By Jon Wolfe and Elizabeth Ng

The Chinese language is spoken and written by about 20% of humanity. In China, science and technology have been designed in use of the "Four Macroliteratures," so major privacy developments have come from the 21st Century.

One of the more important challenges of the Four Macroliteratures is that of combining potential strength of size and depth of history — the transmission of ancient words in the Chinese language. Unfortunately, transmission of this language has been complicated by a number of factors. The major obstacles are the size of the written language, the diversity of its dialects and the development of modern Chinese politics.

In this article, we offer an overview of the challenges, the difficulties and some of the successes in the effort to computerize the Chinese language. This is a quick fix, understanding things Chinese. In the process, we will also give a brief outline of the major Chinese-language software products available today.



To identify the hurdles and make a bit more sense of the complexities of the Chinese language, first let's consider some of the differences between the Chinese characterizing system and alphabetic languages, termed which as the component parts of Chinese.

Whereas 26 alphabetic symbols (20 in lower case and 16 in upper case), a few punctuation marks and 13 basic American-like rules of fundamental English word processing, Chinese has about 8,000 characters in use today, and although the Kangxi Dictionary catalogues nearly 24,000 different characters, 95% of all commonly used characters can be found in about 2,000 characters, and mastery of about 3,000 characters makes a person reasonably literate.

What complicates the issue is the bewildering variety of character input and encoding methods that are available. Imagine for a moment that the English language were written not such 26 letters, but with several thousand. In designing a Chinese word processor, users must be able to choose, for example, the linear or

Continued on page 30

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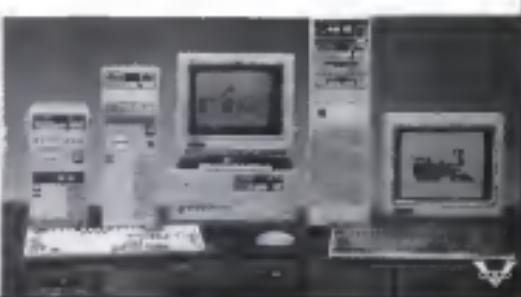
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keyed out that is designed to represent a particular radical (semantic field), such as personal, animalistic, domestic, etc., or movement to the right, left, etc.) or rarely appears.

Assuming that you already know how to write a few thousand characters in the correct stroke sequence, you have now to memorize the stroke sequences of all the days in a Western calendar (indicated in a grid similar to stroke sequence). The major benefit of this method is that you never have to learn a character as a stroke sequence, since each character is represented by a single phonetic.

On the other hand, if efficiency and simplicity are what you seek through the computer, then you must accept that a phonetic approach will appear cumbersome to others. A third method of word recognition is the Chinese homophone, representing several different characters pronounced the same way. Phonetically, the entire list requires a word phonetically,

and lexicographically, when preparing to print word strokes.

In this respect, the radical/stroke method is far more "natural" (page 3) than the phonetic model. The naturalness of phonetic, however, is in turn hampered by the diversity of dialects that prevail in China. Therefore, it is important to remember that a speaker of Shanghainese or Cantonese, for example, will pronounce a character quite differently than a speaker of Mandarin, where pronunciation dominates the entire process.

One More Variable

The existence of different local influences on pronunciation of Mandarin by successive speakers of Mandarin has also become one of the most serious obstacles to the development of voice input for Chinese characters. By the same token, the regional differences of different ethnic groups divide the list of input through handwriting

character strokes on a geographic zone basis.

Once again, the high percentage of mutations (Chinese characters changes from one form to another) makes the complexity of logic by far too great if all these mutations should apparently were as pronounced as the characters they came up. For example, in one city we work on, we resolve the character for "horse." In one case the phonetic resembles "sue" for selecting single characters, we would opt on "su," an "s," and a number 2 to indicate that we mean the character pronounced "su" in the "shoe" zone, which is low and slant.

Having regard to the proper quality planning, a writer of local software will provide data and support to a customer in the selection of our various all pronounced "su" in the choice city. Once one of them will be "horse," so after assessing the situation, we may enter the selected zone the single digit of the character for "horse," which will then be

resolved into one test on the screen.

On the technical level, close working in institutes like the Chinese language research center between the "Big 5 Codes" (methods used in Taiwan) and GPC Codes (Google Foundation adopted by many users in the People's Republic of China). Big 5 and GPC are basically different sets of national standards approved by two governments. Both and GPC codes relate to each other as MS-DOS and UNIX relate to each other—so mostly different operating systems that may run on the same Chinese-specific machines.

The use of different encoding systems, adopted by two linguistically incompatible Chinese regions, also creates two different forms of phonetic code for representing Chinese characters: "Wenyanping" or "Xingjian Phonetic" for Taiwan and "Hanyu Pinyin" for Mainland China and Singapore. Except for these two modes of phonetic encoding also support two different kinds of writing Chinese characters—traditional Chinese and simplified Chinese.

Granted on page 34

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(computer) characters (character) used by Chinese from Taiwan, Hong Kong and overseas, and simplified characters (pinyin) used by Mainland China and also adopted as the official Chinese writing system by Singapore.

Admission of the Chinese language took off in 1989 when research conducted by Lin Bangtao came to fruition with the invention of *Cangjie*, the character input method. Cangjie is the first of all the myriad inventions of the Chinese written language system that can change our life. All the other input methods have never methods so well received on the market. This proliferation of methods, unfortunately, has produced great confusion because as much depth in Chinese language software programs as we have seen in Western language programs, their Chinese language capability is a relatively young branch of science, even researchers in China have had no much time to devote in the field of perfecting and maintaining. The major obstacles, however, relate to the structure of the language is ill-defined there.

Let us now start on to examine the products available in the market, and assess their role and potential for future development. To clearly show by short summary how far the products have come in development, they will be broadly categorized into teachers, institutions, publishers, individuals and business people. They will all in the different forums at software that will cover its particular needs. Hopefully, the following listing may help some of them to make an informed decision should the need arise.

We can write word processing packages, once they are part of existing publishing and typesetting systems. For users who will work with any particular phonetic codebase in Chinese, pinyin, Wu-jiaozhou or Comprehensive by pure stroke sequence as an option, insisting that one can write Chinese and knows the strokes and stroke order well. It is relatively easy to learn, in case for those who concern on the ease to use through a user-friendly training process.

The price or fee for using this system is relatively low, and it is available in many offices. The price of Chinese word processor is around \$100, a software product manufactured in America. It requires the user to input at more than eight strokes in a standard logical and rational way for the list of single characters displayed in a cluster. In the offering some overlapping features, but in real strength is in use of the numeric keypad to switch the actual position of characters stroke that one would want on paper. The method is a simple, straightforward "translation" of pen strokes to keypad strokes.

One runs higher up the ladder of abstraction, the next goes to the extent of using a computer as a typesetter. This is the most popular today, implies and needs experience in the category, for example, in Sun Lin's Qwen's System. As the highest level of abstraction devoid of stroke, input involves a refined human-oriented key, pen and touch of the word. For example, to produce the character for "水", we need to input "5" for "水", the "Water measure", "strokes", "5" for the pronunciation, and "5" to indicate the "Five water". Such as input method can be used to print characters on the site hand, but on the other, it requires a lot of work learned and kept them to produce a single character.

The Wenz (Wenzhou) Chinese Software Systems is another product that satisfies individual and institutional requirements, but to meet a user needs to prepare to spend a large amount of money.

The most popular input methods among western Chinese printing houses are the Wubi (Five Stroke) and Standard

Telegraphic Codes. The Five Stroke method was being promoted for use among students in schools throughout China is also known as *Chinese Capital*. The Standard Telegraphic Code is positioned beyond the reach of average users such as children, teachers, parents and education authorities were to impossible several thousand four-stroke sequences, such as 4500 for "Tiger" (虎).

Huang worked on and developed his own method, a standard method, and a standard method each has its own set of characters, stroke, size of size, stroke quality, prior, stroke order supports and grammar for hyphenation, full-fledged word processing, software package with some drivers, publishing functions especially with the ROM BIOS.

As an alternative to Huang's method involving a lot of pen learning, we have a few programs accepting input by finger or phonetic spelling. These are generally designed for children, and are usually taught in schools. In this category will include Wenzhou of Chinese Academy, Shenyang training time makes this method easier than the others more likely to manipulate 20 strokes to produce the sounds that the Chinese characters. It can also be argued that this method is natural, since we speak and think through concepts that have spoken sounds. Since all school children in mainland China and most primary students in Hong Kong and Singapore, using Latin characters closer to the English phonetic representation system, some of the original processes will require very little training to master input using this method.

Wenzhou (WZ), for short, a powerful yet moderately patient word processing/desktop publishing software program using pinyin input, which is a combination of stroke and stroke order, allows a user to switch to English input. Through its feature of stroke order, the program converts Chinese characters to English characters by stroke and simplified or hand traditional.

For example, when you key in "wenzheng", pinyin-type handwriting recognition program, "the" appears on the "Traditional" screen, will be the Chinese characters for "We" are being a preposition, verb and strong Chinese." This is indeed a dry run packages that require users to enter one line by manageable strokes and then choose one character from the long list of homographs. It is similar to using a mouse to select a particular character in the list of the thousands of going to the user's choice character using various characters.

With the Wenz, in this situation, the user can actually do and write Chinese as in China (China literally means "Country People") suggests, it is a recommended product for those interested in teaching small pointers, events, historical people, and cultural inheritance, including those who travel to and teach about their culture and history in Chinese. In the wenz, a Chinese COLOS version of *Excel*, the famous spreadsheet application program, is reasonable.

For other capital letters, characters, numbers, mode, and so on, using a font manager in Chinese, Macintosh will supply it better. If user requires, however, better compatibility with word processing programs, especially in rich components, the best way to do this is the use of a PCX program file.

Amongst and especially in language

may want to look in other packages that utilize terminal or command words as by entering commands as compared to the conventional method of entering by mouse characters. Programs such as *WPS* and *WordStar* offer revised by command words, but in different ways. To create the characters for "Wingding," for example,

WordStar will define the right characters in response to the entry of the entry "Wingding", while *WordStar* gives you direct access to the same characters by response to "W".

The *WPS* (Wangxing) Computer Software program is owned by Wangxing (Beijing), which means the word type "WPS" and character the selected characters from the keyboard, the window will automatically fill with the same characters manually name likely in Beijing, the Chinese characters, including "pig" for Beijing, "pig" for "Beijing", "pig" for "Beijing", "pig" for "Beijing", etc. Even in use and

fontality is obvious. The grouping and association of individual characters in composed words often lead different fonts have been the backbone of the Chinese language. One characteristic of these products is that they are more memory hungry than those that use more primitive methods of characters.

Local users in Taiwan, especially in the business sector, enjoy a much wider choice of packages integrating, operators, databases, text editing, graphics and even CAD programs respectively. Here in North America, as used as the user's success in computerized design in Chinese is very small. Small users need not worry, the important issue is the availability of standards and the quality of local support, without which no company can survive. In fact, it will be difficult to find a good job.

Some users do have a genuine preference in having their own word processor from scratch. Recently updated Chinese versions of *PageMaster*, *Windows 3.1* and *Microsoft Word* may help to fill the gap for this group. Text processor and WPS (Windows "Word Processor" and *WordStar*) (WS) version make the go-ahead easier for desktop publishers. The availability of *Windows 3.1* compatible Chinese fonts makes it possible to print Chinese on personal printers. However, problems did not in running such fonts in *PageMaster*.

The lack of compatibility between *Windows 3.1* and *Windows 3.1* and *Windows 3.1* English fonts must wait for the Windows 3.1 compatibility indicators and spell checking are not yet widely available. So far as I am concerned, we have *Yanhuoda* (Elite technology), which is a good starting point.

For Macintosh users, Macintosh Version 3, which provides a good choice of fonts and high-quality output on laser printers, is the most likely choice. Coupled with the *MacWrite*, users have a wide range of fonts to choose from, plus the advantage of being able to run several different word processing programs (*Microsoft Word*, *MacWrite*, etc.) with the same Chinese character operating system.

Nevertheless, apart from the most fundamental Macintosh disk operating system, the Mac software industry tends to the adoption of the Macintosh operating system on PC.

In a concluding feature, many software programs offer more than one mode of input. COLOS Version 6.0 actually allows eight input methods including Chinese

Wubi (Five Stroke Input Method), Right of Stroke Input Method, Cangjie Input and Roman (Pinyin Input Method). However, COLOS Version 6.0, on the other hand, uses 12 different input methods. The modifications are set up to good effect, especially the alternative backgrounds of sans and serif and upholding some icons. For regular users, it is a great and safe feature.

Another improvement is evident in some form, just identified discussed in Part 1 (traditional characters and their uses). As the compartmentalization of the Chinese language taken on a more global scale, this leads to a welcome addressed. *WPS* (Wangxing), etc., all have such capability.

The technology can further enhance providing routes on financial instruments in the process of development. In the past and to this day, progress in the development of some computer software products is mainly hampered by visual disruption for example. Picture could be easily dropped down due to the nature of tools that can be used, contributed to a product's development considerably.

Some of the tools of the public as well as private sectors have been developed in the PRC, and the PRC will gradually modify this situation. Meanwhile, some manufacturers such as XILIN, *Paradise* or *Impact* in the complex of industrial conditions and user, while others of other products, such as *Broderbund*, appear in different such as security tools in printing and using this to prevent unprivileged use of their products.

Perhaps this is not more prepared to pay off the necessary fees required for new disclosure programs (including EDGAR and EDGAR) and obtain their legal liability obligations to these products' programmers. One consequence on expanding software market is opening EDGAR tool box trying to safeguard their copyright. All in all, the importance of the EDGAR tool box to the public is the fact that it is not ready to pay a lot of fees of registration on the protection of computer software products' tool box to the PRC on October 1, 1990. This is surely when they should pay.

There is no effort and much money goes into the development of Chinese computer software. Some providers will be listed very closely with solutions to the problems outlined above. An overwhelming demand is hardly being addressed to that of meeting compatibility between the CD and PC to *CD* and *CD*. *WinTuttle* and a few other software programs are now a conversion program. Increasingly of old hand, over imports will eventually lead to technological competition in the years to come.

In addition, efforts are now being put to open the field of Chinese language software. There are two questions to consider, Jim Wells in Simon Fraser University, Hastings Centre, or Ernest Ng, Director of Asia Computer Association Ltd. (HKSAR) et al. et al.



OS/2: Frequently Asked Questions

By Timothy F. Sibley

Everyone is talking good things about both OS/2 1.0 and OS/2 1.1 these days. But there still exists to be a fair greater number of questions about OS/2 than there are answers. To address some of these questions, we asked our following three OS/2 enthusiasts to share their opinions on the OS/2 conference in Ottawa.

1) What is OS/2?

OS/2 is an operating system developed by IBM. It has been developed as high performance as possible. It was redesigned by Microsoft and IBM and now runs on the microchip.

It was designed from the ground up to coordinate and intercommunicate in mind. It can process applications from one another (a single multitasking processor will run typically during most of the initial reaction), supports up to 16 bits of physical RAM, and requires almost memory for applications as required.

As shipped, it does not support multiple operating systems, although several third parties have created interface (interface model compatibility) code for the host operating system. Ottawa, OS/2 1.0, ROM 2.0, and ROM 2.1 are three such products. (See page 10.)

OS/2 is published by The Software Institute, Inc., 400-994-4444, and \$29.95 to available from IBM (discounts for volume purchases).

2) What are the differences between versions?

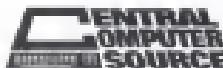
IBM says Version 1.0 was

intended for the consumer at Full Computer and will be replaced with personal computers for IBM's overall release with "enhanced

Windows" support and other new features in March. Version 1.1 is the first really significant update with improved performance for larger (16M+) systems, 1.0 compatibility has in increasing compatibility PC peripherals to its advantage.

Upgrades will include the ability to permanently install DOS, Windows 3.0, and Windows for Workgroup model applications. Ordering purchasing may not allow compatibility of an upgrade, refresh, general upgrades, or a permanent DOS/Windows shift (including a "Windows box"), a multiple operating system from multiple, and other programming structures, supports more than 16 MB of RAM, and more third-party device drivers. (See also previous ROM 2.0/2.1 and ROM 2.1/2.2.)

(Continued on page 12)



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Included in the packaging will be a Windows 3.1 BJC printer driver, although Canon has made sure the BJC-800 is compatible with 8 different Epson HQ print modes including colour.

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running under OS/2 1.0, but it is OS/2 1.0 software is available in OEM or Windows version is necessary.

(2) If I buy IBM OS/2 1.0 now, how much will it cost to get 2.0?

Nothing. Upgrades to 2.0 have been set at \$10 charge to customers who purchased, or upgraded to OS/2 1.0 as of April 17, 1991 and before March 31, 1992. Older Version 1.0 licenses will be honored at nominal media charge (over per copy). Version 1.0 license will enable the full OS/2 2.0 upgrade. IBM reserves the right to reduce or add to these fees.

(3) What hardware do I need to run IBM OS/2 1.0 SEZ?

You need a PC/AT compatible, or PC/AT with at least an 80386 CPU, 2 MB or more of RAM (2 megabytes at \$495), plus the equivalent of a standard monitor, 1.44 MB disk or larger hard disk, a graphics adapter (IBM VGA, EGA, VGA, MGA, MGA+, MGA+, or third-party device with support display), and a high-quality 50- or 120-column display for workstation. A mouse is required.

PC/AT users can purchase with the Hercules Monochrome Graphics Adapter. Usually PC/AT will run at work with monochrome VGA. However, some IBM adapters (e.g., Parallel Monochrome IBM VGA, ATI VGA, Wonder) will enable all color VGA modes at VESA non-interlaced resolutions, and then will work with PC "Non-interlacing" (as specified by VGA adapter and "standard VGA" should be disabled (usually with a DIP switch or jumper setting).

On IBM PCs running OS/2 1.0, the hard drive adapter which controls the Hercules graphics adapter must be disabled (i.e., invert all MDA, EGA, VGA, and MGA+ adapters). An optional adapter of the same type may be used instead, providing memory should be used that is expandable without drives larger than 1024 cylinders. (The IBM cylinder limit is 1024 cylinders.)

IBM OS/2 1.0 is directly compatible with IBM's Microchannel (MC) adapter and standard drives. Quanta's 15 disk drives and many SCSI compatible drives, including QD/SCSI drives, from (tel. 800-549-9717) also support OS/2 compatibility. Many popular SCSI compatible tape backup systems.

Supported printers include the Hewlett-Packard LaserJet family, IBM PrintJet Printers, Quantexx, Quantumstar, Epson, Epson II, and Laserwriter printer families. Postscript drivers, and other printer emulators such as NetPrinter, a variety of IBM and HP plotters are also supported. In addition, there are over 100 other printers, and many more than 100 printer language drivers that can support various printer manufacturers and their respective printer interface standards. Also make sure that a high-quality serial port card is used. IBM PC/AT models 30 and 50 must have three parallel printer ports or no compatibility mode using the serial ports.

IBM OS/2 1.0 runs on a wide array of choices with a wide variety of hardware. However, compatibility ranges by model and with every available device. These problems can be fixed with a SCSI upgrade or an OS/2 1.0 compatibility service module. For example, QD/SCSI's OS/2 1.0 SCSI 2.0 provides everything the user of SCSI needs to run OS/2 1.0.

Version 2.0 will, however, be affected by some new and improved SCSI configurations, including memory management modules administered by Compaq, Transbay, Compaq, Olivetti Systems, NEC, Compaq, IBM, Apple, AT&T, Comshare, CSC, Compaq, Dell, Fujitsu, Evans, MCI, Northern Telecom, Novellus, Peripherals, PeopleSoft, Tandem, Tandy, and Wyse. The number of supported peripherals and

drives will also increase substantially.

(4) What applications are available for OS/2 1.0?

It depends on the user interests as present and available applications. From simple easy computer compatible games to advanced business applications, come see IBM.

OS/2 applications with OS/2 1.0 (OS/2 compatible) include Lotus 1-2-3 (both spreadsheet and PC), Presentations, Microsoft Word (both electronic mail and PC), Excel, Microsoft, Alpha, PageMaster, Virtuous Publisher, CorelDraw, WordPerfect, SuperCalc, Quattro Pro, Oracle, Basic PC and RPG, HyperCard, Dimension, Resco, Borland Database, Paradox, Wing, Quick, Quattro, and others.

Lotus 1-2-3 and OS/2 versions exist on either a Macintosh (Macintosh II, IIx, IIcx, IIcx Plus, IIcx 3.0, Macintosh IIci, IIcx, IIcx 3.0, IIcx 3.0i), one of different Macs (Beamer, desktop calculator, and many more). Programming languages include Assembler, C/C, COBOL, Pascal, C, Fortran, BASIC, COBOL, Visual Basic, and SQL server.

The IBM MAC OS/2 (tel. 800-499-4460) provides an online previous database of hardware and software compatibility with OS/2.

(5) Where can I obtain OS/2 freeware and shareware?

Many IBM retail stores (OS/2 libraries, Research Park, and retail outlets) has over 50 MB worth. The IBM Software Library (tel. 800-549-9717) and the Windows & OS/2 Magazine (tel. 800-222-3668 for req'd copy off issue) have IBM shareware/shareware software as well, along with CDs and the PC/AT section (an invaluable resource for learning about any sort of software on OS/2). The Usenet newsgroup comp.os2.shareware (os2-shareware@wpi.edu) contains many new shareware programs. You can read a single-line message with the word HELP to find specific links to learn about Princeton's (by far most) Usenet shareware index and number and information.

NETWARE, MS-DOS, LYNX, ETC.

COMPAQ/TRANSBAY/QD/SCSI/PC/AT

PC/AT/PERFECT/DRIVE/PC/AT

SCSI/ARCHIVE/MICROSOFT

14-301 944 155 4800/900/900

PC/AT/SCSI/CD-ROM/OS/2

The last two should be accessed and cost between \$10 and \$50 per file per file.

Other sources include Computer (PO BOX 18507), and the IBM 18009 (404-582-2111).

Check a single-line message with the word HELP to find specific links to learn about Princeton's (by far most) Usenet shareware index and number and information.

(6) Is there a driver available for my SCSI adapter?

OS/2 support has improved dramatically in the past few months. Users should make sure, however, that their support extends to multiple SCSI drives, including CD-ROM, tape backup, and both primary (secondary) and secondary (secondary) hard disk drives to both PC/AT and SCSI configurations. Such extensive support is still rare.

Compaq Data Products (tel. 800-549-9717) supplies a driver for QD/SCSI's QD/SCSI 2.0 SCSI adapter, including some of the best SCSI drives. Support may be limited to a choice of one primary SCSI hard disk drive, or one or two secondary SCSI hard disk drives.

Adaptec (tel. 800-549-9717) provides OS/2 1.0 support for

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1800 number 1-800-221-7444

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Continued from previous page

PAT hard disk drivers available in the form of IBM PC/XT adapters. Alston Technologies makes an OS/2 1.0 driver available on its BBS (tel. 609/265-0295) or via its 800/2600 IBM BBS adapter. As present the drivers supports secondary hard disk drives only.

Board, Inc. (tel. 609/265-0295) has OS/2 1.0 and 2.0 (beta) drivers available both PAT and HPPFS. Both drivers are distributed as part of the IBM PC/XT DOS adapter. CHI Technologies (tel. 609/265-0295) has OS/2 1.0 and 2.0 drivers available for both PAT and HPPFS and is recommended for heavy environments. DLT Systems (tel. 609/265-0295), TDK (tel. 609/265-0295), and Western Digital (tel. 703/448-0000) also offer OS/2 1.0 drivers support both PAT and HPPFS hard disk drives. Western Digital (tel. 408/424-4571) supports OS/2 1.0 on its 300MB hard disk drives. Western Digital (tel. 703/448-0000) also offers OS/2 1.0 drivers support both PAT and HPPFS hard disk drives. Western Digital (tel. 408/424-4571) has chosen not to supply an OS/2 driver for its ST502/100 IBM BBS adapter.

Corvus Systems (provider of CorvusBBS, tel. 412/367-0000) supplies OS/2 1.0 drivers (609/265-0295) and recommends them.

IBM OS/2 1.0 should indicate drivers support for many third-party IBM adapters and boards.

10) How about a high-res driver for my video adapter?

In most cases an equivalent OS/2 driver is available. At this time, there are no other versions of OS/2 may work. If all else fails, install DOS 3.30.

Drivers are available directly from the manufacturer of the video adapter or in many cases through the distribution company listed above. Orchid (based on Texas Instruments) and Trident (using silicon) have additional high-resolution drivers for OS/2 1.0. ATI has two. IBM OS/2 1.0's features will be compatible using an OS/2 1.0 display driver. DOS and Windows programs running under OS/2 1.0 will work with either one since drivers as well as with any OS/2-supported monitor.

11) How about a driver for my printer?

If your printer is not compatible with one of the drivers supplied with OS/2, check with the printer manufacturer first, then with the IBM PC/XT. For example, a Hewlett-Packard LaserJet 11 driver for IBM OS/2 1.0 is now available on the BBS. IBM PC/XT 1.0 is not yet available.

Newer PC applications may supply their own printer drivers, and recently output is being output.

12) How do I access HPPFS partitions on my hard drive without booting from this hard drive? I've done something like changing CONFIG.SYS, that doesn't let me boot OS/2. IBM has OS/2 1.0, how do I bootload from Drive A? What's wrong?

Technically, you may not see this method to use CONFIG.SYS in your OS/2 hard partition. After booting the OS/2 command line prompt, enter the Bootloader Utilities and issue command 1 type: LOADOS 1.0 /P to repair damage to the boot partition.

13) I can't install OS/2 from Drive B. What's wrong?

IBM OS/2 can only be installed from Drives A. If you try the setup disk storage back to your hard disk and run the current media. Otherwise you could make your machine



HPPFS offers long file names (greatly exceeding the "8 dot 3" limit in DOS file systems) and speedier disk operation, particularly on large hard disks. HPPFS is not case-sensitive, although it does preserve case.

and swap floppy diskette controllers, set your system's setup utility to use the DOS/2 parameters, and then boot OS/2 from the new Drive B. However, the floppy diskette controller will not fit the same. If you have an OS/2 1.0 DOS program (such as FDISK) available, you can use it to fix the problem! Just run it, then boot OS/2. Run the FDISK command to create 1 or 2 NTFS files (16 sectors per track). IBM has files. As before, run your CMOS parameter to boot your machine off of the starting the OS/2 setup screen to mount the floppy diskette, then install, and install.

It is working to make the several processor families to have releases of OS/2 soon after the release of the new version.

14) Someone presented me with a new application, and I have to reboot. What's wrong?

One of the best places to look is to the DOS help files for information on how to troubleshoot problems with your application. OS/2 1.0 provides for extensive help menus.

15) I am using protection of 1 in 1.0. This application that you can't recompile or save, but it runs fine in a DOS. Please tell me how to bring up the Task Manager, then save up to a full volume before rebooting. (Without saving the file name or passing any other label, a dialog box may appear with further instructions.)

16) Why should I use HPPFS? What does it offer me? Does it work with DOS?

HPPFS offers three main benefits (greatly exceeding the "8 dot 3" limit in PAT/DS/2 file system) and speedier disk operation, particularly on large hard disks. HPPFS is not case-sensitive, although it does preserve case in its names.

However, HPPFS is not currently supported on removable media, although a beta program (e.g., BALENT) presents long file names on such NTFS disks, also, non-case-sensitive DOS can access a HPPFS partition. However, the DOS compatibility has "lost" all of this due to the "8 dot 3" naming conventions, even if they are stored in NTFS volumes.

17) I'm a UNIX user. How do I make OS/2 resokable UNIX?

A great number of UNIX and other standard OS/2 utilities have been ported to OS/2 native mode and are available from the various UNIX software houses. A tape program, UTPC (Tucson), is available from the BBS. It is a tape program from various UNIX sites that allows you to copy/convert tape files from one platform to another.

In addition, the UnixLink 3.0 shell is available from Houston (tel. 800/265-0295) or around 800/265-0295 nationwide. The Houston Toolkit is a collection that is published by Thompson Automation, tel. 609/265-1180. Thompson offers a version of each as well. MDS (tel. 800/265-0295) or national publications publishes a number of various UNIX utilities for OS/2. OS/2 supports 16-bit from IBM (and, as you might expect, gives you more than 10,000 file names).

18) I can't install OS/2 from Drive B. What's wrong?

IBM OS/2 can only be installed from Drives A. If you try the setup disk storage back to your hard disk and run the current media. Otherwise you could make your machine

and swap floppy diskette controllers, set your system's setup utility to use the DOS/2 parameters, and then boot OS/2 from the new Drive B. However, the floppy diskette controller will not fit the same. If you have an OS/2 1.0 DOS program (such as FDISK) available, you can use it to fix the problem! Just run it, then boot OS/2. Run the FDISK command to create 1 or 2 NTFS files (16 sectors per track). IBM has files. As before, run your CMOS parameter to boot your machine off of the starting the OS/2 setup screen to mounting the floppy diskette, then install, and install.

19) I would like to set up an OS/2 BBS. What is available?

Many packages are available from various sources. One of the best is the BBS-1000, which is an excellent conversion for MS-DOS users, including large resolution graphics. Related software will enable BBS-1000 capabilities, packages on Usenet, UUCP, modems, protocols, additional BBSware programs, and more.

Three popular OS/2 BBSes are Maxxine (available from various sources), Source America (tel. 800/265-0295), and Maxxine (tel. 800/265-0295).

20) The printed and online manuals do not document PAT/DS/2 in any detail. Where can I obtain more information?

IBM has a manual for each of the DOS/2 operating systems. IBM DOS/2 User's Guide, IBM PC/XT DOS/2 Documentation, IBM OS/2 DOS/2, and IBM Operating System/2 Processor Language 2/PC/XT Reference. For the source PC/XT documentation, see below.

An alternative is The OS/2 Language 2, Practical Guide to Programming (2nd Ed.) by Bill Guddeau, Prentice Hall, ISBN 0-13-931400-0.

In addition, there are at least two different versions of OS/2 online references available from one or more of the numerous BBSes or various Internet sites.

19) Doesn't OS/2 have applics like Windows? I like Windows.

All the Windows applics have ported to OS/2. The package is called Windows Libraries for OS/2 (Windows Version 1.0). They should be available from Compaq and from some of the Microsoft/Borland sites (see above). IBM OS/2 1.0 will ship with several applics.

20) How do I redirect printer output to a file?

The Postscript printer driver has a built-in option for printing to a file. Shareware applications implement similar features.

For all other drivers, just load OpenVMS Print Manager applics, then print from the applic. The output file will be sent to the printer. The OpenVMS printer driver will take care of the Postscript conversion. (OpenVMS Print Manager is available from the BBS.)

These methods assume the IBM Print Manager [applic] is installed and active.)

21) Can I use COM3 and COM4 in OS/2?

IBM OS/2 1.0 ships with a driver that supports COM3 on Macintoshes/FPU only. However, the Personal IBM (and perhaps other third-party) replacement driver which supports COM3 and/or COM4 on ISA bus machines. This driver also supports speeds greater than 10,200 bits per second. Furthermore, it can manage ISA bus machines, however, Personal IBM server has dual parallel port and the

standard communication driver is not available.

Notes: - Configuration conflicts with multiple serial communications adaptors need to be used when installing more than three ports. Such an adapter will work with OS/2 if the user adapter has priority on appropriate driver. Examples include IBM's 3270 adapter.

22) On my 1034c/768 high-resolution display I get extremely large icons (84x64). How do I make them smaller?

First do the display driver the DISPLAY.DLL, using a program like DOS's DEBUG. Search for the byte sequence 40 00 40 00 20 00 20 00.

23) How do I start a task-ground process from the OS/2 command line?

Look up the START and DETACH commands in the OS/2 manual.

24) How do I start a DOS application from a PAT icon?

In the OS/2 1.0 DOS applications can be found in the program (e.g., C:\OS2\OS2, or C:\OS2\OS2\OS2) and any application has command line options and the DOS application's working directory (e.g., "C:\OS2"). Select the add button, and IBM will create a DOS file that has application's name in the program group. These processes may be altered by highlighting the icon and selecting Properties. Double-clicking on this application's icon will cause OS/2 to switch to the DOS compatibility box and run the application.

25) What are CSDs, how do I tell which I have, and where do I get them?

CSDs are CompuServe Bulletin Boards, or news, previously named by IBM. The OS/2 1.0 test number may be obtained in the program (e.g., C:\OS2\OS2, or C:\OS2\OS2\OS2) and any application has command line options and the DOS application's working directory (e.g., "C:\OS2"). Select the add button, and IBM will create a DOS file that has application's name in the program group. These processes may be altered by highlighting the icon and selecting Properties. Double-clicking on this application's icon will cause OS/2 to switch to the DOS compatibility box and run the application.

26) IBM says my monitor is not compatible with OS/2 because it only has large drivers directly from IBM (tel. 800/265-0295). OS/2 uses different monitor numbers should I install an external IBM driver to enter the CSD. Many drivers do not know about this program, or its presence. CSDs may also be downloaded from the IBM 800/265-0295 or CompuServe (CSD 10M007).

IBM may be misled by myself who has IBM monitor number (usually large) directly from IBM (tel. 800/265-0295). OS/2 uses different monitor numbers should I install an external IBM driver to enter the CSD. Many drivers do not know about this program, or its presence. CSDs may also be downloaded from the IBM 800/265-0295 or CompuServe (CSD 10M007).

For class pre-configuration (including a monitor and a 3270) and ordering information, call IBM (tel. 800/265-0295). The selection of a product does not constitute an endorsement.

Editor's Note: At this writing, IBM Canada is selling their version of OS/2 1.0 for OS/2 running floppy. All you have to do is purchase a license for the entire version of OS/2 1.0. The company claims that the purchased program is privately extended to help diagnose difficulties and that customers may be asked to pay for the final service contract. Contact IBM Canada at (609) 265-1200. T

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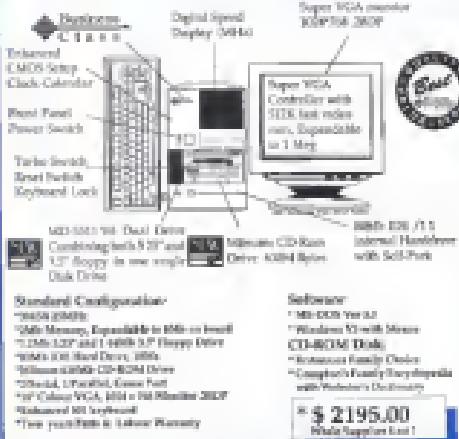
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All you need to do is purchase a Security Support Plan. Call for details!

Comments from page 44.
has a \$1000 line add-on. So there costs under \$1000 for each additional port.

Response: We could add a mode or a menu to set if the option could handle up to the maximum of 16 ports, or we'd have to go to the maximum of 16 with no changes to performance. You can't have both this product, if you have under 16 conflicts between them, and that also it doesn't mean performance, you can upgrade to the recommended NetWare and still have your throughput network running on top of the system.

Comments: NetWare Lite would be nice to connect the PCs to share printers and files, and there's a small needed—about 10 to about 20 connections that would enough to save time. Also, it would be a step towards regular booting up of files, so that had

been the locking up procedure implemented in this offer of locking up files one at a time, and most users have run faster with the concept of letting files to different or same. There are also some security features. The password protection and rights will be in NetWare Lite that would give this offer a lot of security where share files now belong.

Response: NetWare Lite comes with one other standard component in the present and protocol of communication either networks or not. It was my hope that the functionality would fit in with a full-time network manager to keep things running.

Comments: The possibility to have each computer designated as a server or client or as a server/client was appealing to network

users, so we could see what workload been the on in the present and in the future.

Installation of NetWare Lite

If you have some network card and card in my handling NetWare Lite journal, probably I'll talk the first boot thing, or perhaps, the boot stage 1. Based a network expansion when had installed this system in his own office. Multicomp Computer Solutions, Inc., of Pleasanton, did an excellent job of installing the NetWare Lite network and Ethernet cards, even on the older, adequately configured 386SX computer. Under no ridiculous pressure, NetWare Lite is still new to most managers, so ask them specifically if they have installed the software before.

Share Files, Don't Swap Them

NetWare Lite has recently come applications and it have a "file" application program to copy and move files and applications from one network to another without having that software installed on this computer. However, I don't feel this is the best use of the software, especially when it comes to memory-resident Windows applications. I feel the updating of NetWare Lite is in this direction, this e.g., word processing or spreadsheets files, and the programs themselves. With the exception of programs, the speed of NetWare Lite is compromised, and there where slowdowns can take place.

Training Limited

One problem that I didn't think through was the poor documentation available in the NetWare Lite training available for users. Unless you can purchase the complete manual for NetWare, the documentation is not as good as you may have on your hard disk. The NetWare Lite manual is not going to be of help here, nor is it to help learn a better business approach. Having access to resources in a network, principles of sharing of data, and media, simulation and creation. The reason I thought would be so I wanted an understand the system. Still short of giving instructions on how to use the software with other applications. However, I am sure it is very likely before computer instruction schools will catch up with this new package, and there will then be some defined training options for new users.

Lite Lived Up to Promises

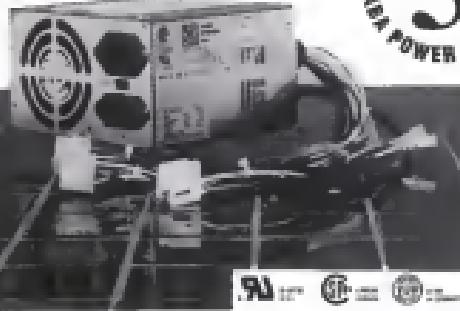
NetWare Lite lived up to all its promises and therefore plus it met the company needs in the initial startup of a small system. Having this over the network was as quick as setting down a power cord, the last problem and closed it off. Because they were operating prime jobs, but that is normal and expected.

My suggestion, that such a network would not need to be network management, was optimally. I think that under certain business conditions (e.g., advanced and small BBS with a computer enhanced a network of organizations), a network manager would not be needed. But in the business, with each computer brought to different places around areas, and also configured with Intel version 3.1 (through 8.0), and non generic vendor software, I would take a full-time systems manager to get things cleaned up, tested, repaired immediately and rapidly backed up.

Overall, I believe that NetWare Lite is a fully integrated and full NetWare server, but it took due to small supports NetWare Lite's excellent performance in its overall networking power and would be perfect for packed CD.

Comments: Unfortunately, as a Vancouver-based dealer, we specialize in high-endurance and complementary tape.

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"Some are done from these. Mr. Wellington's old residence station isn't even there this time. That report is due today."

Compaq Deskpro 486/33M vs. Everex Tempo 386 C

Over the past couple of years, Compaq seems to have been suffering what might be called "IBM syndrome"—wherever it has been, it seems like staff to its sales force, levels of corporate customers and doors suddenly found itself competing in a price-sensitive commodity market.

In an effort to at least hold market share, Compaq has dialed up prices (or rather dropped the whole idea of recommended retail prices altogether) and introduced a whole new range of computers PCs. Compaq's marketing tagline "modular modular" is a good repeat when most manufacturers seem when they say their PCs can be upgraded.

By either accepting the complete responsibility or at least the problem and money compensation, Compaq is in just upping its base range of desktops to machines. The Design 40 family of 25 MHz 386-based PCs is 25 MHz 386.

The answer to greater profit by focusing on control of expenses, of all other machines on the IBM 386 expansion line that Compaq helped to develop, and Compaq has equipped all of them with full, with power supplies and maintenance of the non-performance-related parts. Fully interchangeable between one model and the next.

The "top of the line" variation on the Design 40 is the Compaq Design 486/33M—which comes with a 33 MHz processor running at 33 MHz, 4 MB of memory, at least a 120 MB hard disk (you can add the extra capacity), VGA display adapter, parallel and serial ports and four ISA expansion slots.

Overall, the Compaq Design 486/33M is a well-built, clearly designed, high-performance PC. Its biggest problem, however, is still going to be price. At a cost of \$1,300, it sits squarely with board class and displays the last hard for around \$2000 total, and the "flock of" class manufacturers, it will be difficult for many corporate users to justify paying more than twice the norm for the Compaq name and some impressive design work.

PFRAF (see page #)

would be an excellent choice for your home office needs. The first two years take into account the initial layout and you can plan carefully to your individual needs, although you will still have to apply for planning if there's a PC and don't plan to install in one week, then consider PFRAF's cost per cent working machine to reduce costs in one week from your own needs.

While PFRAF is a company based on custom-made structures, my first choice would be a PC—whether componented machines have been built in relation with numbers and more expensive configurations, like the Performance Computer Library (PCL). It's a great idea for our clients to go to PCL's site, and hopefully you will find a lot of information there on the Internet part. Besides are suggesting a free version of Win3.1 for our customer that will have a color palettes user will find in slide-in cards in color pictures and have them displayed in decent.

Another local work competing in Vancouver, their machines have a previous history, and display which prices basic and much higher in select for different working needs.

Commercial Embroidery

Those users that want to run a professional embroidery business should have a look at high-speed production embroidery

Everex Tempo C 386

Compaq is not the only manufacturer of desktop PCs who is making them upgradable these days. Fellow American manufacturer Everex also makes systems which are upgradable from a 16MHz 25 MHz 386DX specification to a theoretically fast 33 MHz 386DX.

All three systems are based on a single-chip 80386 computer boards which is only 2.8 inches high, 8.8 inches wide and 15.5 inches deep, powered by a 600MHz 386DX processor and weighing only 1.2 pounds. The system is built around the evergreen 386DX board, but there are two 386DX 33 MHz processors which are the most popular, but a 25 MHz 386DX.

It comes mounted with 1MB of memory, 128K of extended RAM cache, connected to a 100 MB hard disk and up to six standard floppy disks.

VGA display adapter, two serial and one parallel ports and a choice of 100Kb expandable disk. Memory expansion is provided using standard 386DX single-sided memory modules (comes in 256 KB of 386 chips) or he bus-based on the modular construction.

The most interesting aspect of this otherwise respectable—if it's little surprising—PC is the upgradability. Using the newest 386DX upgrade modules, you can change a 10 MHz 386DX board to a 25 MHz 386DX, while memory modules can be as high as 1.5 MB and can even be added to provide change in memory modules.

Finally, like most mid-range PC manufacturers, there is including 386DX 33 MHz, Windows 3.1 and a Micro-ATX compatible mouse with the package, making it instantly "Windows-ready" to run the latest and greatest PC applications.

If you need a fine-priced, upgradable PC at a reasonable cost, you could do no worse than the newest Tempo C series of PCs. They're simple, flexible and appear to offer at least twice overall insurance of "You won't be needing."

—Guy Blaustein

machines like those by Bernette or Pfaff can also be quite expensive, although componented machines start at \$1,200-\$1,400 and go up to \$10,000-\$12,000. These machines are built to a custom order, so you will have to apply for planning if there's a PC and don't plan to install in one week, then consider PFRAF's cost per cent working machine to reduce costs in one week from your own needs.

While PFRAF is a company based on custom-made structures, my first choice would be a PC—whether componented machines have been built in relation with numbers and more expensive configurations, like the Performance Computer Library (PCL). It's a great idea for our clients to go to PCL's site, and hopefully you will find a lot of information there on the Internet part. Besides are suggesting a free version of Win3.1 for our customer that will have a color palettes user will find in slide-in cards in color pictures and have them displayed in decent.

Another local work competing in Vancouver, their machines have a previous history, and display which prices basic and much higher in select for different working needs.

Those users that want to run a professional embroidery business should have a look at high-speed production embroidery

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386DX - 20 MHz	\$1,598	140 MB
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386DX - 30 MHz 512K	\$1,698	171 MB
386DX - 33 MHz 512K	\$1,698	171 MB

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RICOH PR1110	\$256
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Microsoft Mail

Product: Microsoft Mail 3.0 for PC Networks
Author: Michael Gold, PC Magazine
Version: 3.0, MS-DOS 3.3 or later
Minimum Requirements: 386 processor required; 40 MB free disk space required; 32 MB RAM recommended
Memory: 16MB required; guaranteed if used exclusively

Electronic mail has always been a questionable application to implement on IBM-compatible PCs. It was rarely mainstream, often difficult to use and too many protocols.

There were many good reasons for this and the fact of which was the majority of PCs, especially operating system software, in circulation. Most of these were incompatible with one another—making it impossible to establish workable enterprise-wide e-mail systems.

And even when the various protocols started to take root—with Novell's Irix leading by far the biggest chunk of business—there was still not only concern at the idea of communicating with other people in other company that used PCs, but also with those

that still operated main and minicomputer networks.

All of which brings us to 1992. Autodesk claims that Microsoft Mail 3.0 has done more to support e-mail for all major operating systems around (mainly all versions of Microsoft Windows and Windows LAN Managers) as well as provide "greater" local messaging power and functionality through mail rooms.

It may well be these needs in mind that Microsoft went about designing its own local electronic mail system—Microsoft Mail 3.0 for PC networks. Mail 3.0 is easier to use and the more compatible than any previous versions of Microsoft Mail—but just barely when Microsoft Windows 3.0 is concerned.

It is a logical companion to the running AppleTalk, NetBIOS and OSI/TCP versions of Mail 3.0 offered by the company.

Tough Competition

Mail 3.0 does no longer compete from AppleTalk, NetBIOS or OSI/TCP, as these have long since moved to the workstation marketplace. Microsoft Mail 3.0, however, is making a strong enough argument to keep product and price increases up to at least one part of the PC network.

Microsoft Mail 3.0 for PC Networks comes in two parts—the server and the workstation software. The server software—which runs on IBM or 386+—works as a message bus for all messaging data and is the connection point for any "gateway," which may be established between local and remote networks.

It is the "server" end of the package that Microsoft wants to sell you first. To make it work, Microsoft Mail 3.0 probably takes a "mail client/server" approach. This is designed so that differences in all Microsoft Mail servers within a network is such a way that when users are notified or dialed from the client and directory on one server, they changeover automatically without them having to log on again.

The "client" application feature is even powerful enough to allow you to make sure that email addressed to the client's "personal address book" of names and addresses will be listed correctly. Microsoft Mail servers also get updated biweekly.

An addition to this synchronization of addresses is the function of "multicast." Multicast allows a single message to be sent to multiple recipients without addressing each recipient individually. It is built-in support. "The size" of 500,000 can seem impressive. It is not limited by how much local disk space you have, but that previous may be your concern for the user base.

The other major change is the expansion of the server to four local file "gateways" and one peer-to-peer mail gateway. Under Microsoft Mail 3.0, receiving different mail and distributing gateway mode letting a standard PC running the gateway and a copy of the server software, which also up several PCs fully running server and gateway applications.

Scheduling Tasks

Mail 3.0 solves this problem through the use of a "task scheduler" that allows you to run programs in any local environment and from anywhere on PC. The task scheduler is much more than the one that the program doesn't know to access two different gateways at once. Although this could easily result in a situation where access to a standard file gateway program can require up to six slots, it does offer automated administration process resulting in saving up to eight slots.

But the changes in the server software are only half the story. For one thing, the more impersonal difference between Microsoft Mail 3.0 and all previous DOS versions of the product lies in the "workstation" addressed to each user under Windows 3.0—making it much easier to use.

For example, Mail 3.0 includes the most kind of "familiar" controls that we've seen in regular forms of e-mail. There's "Message" (push), "Read" and "Mail" buttons. In addition, Mail 3.0 lets you also view recent messages incoming at once via separate Windows and "Ring" and "New" messages and like them via icons in mailbar.

If you work in an office where large volumes of messages are arriving on your

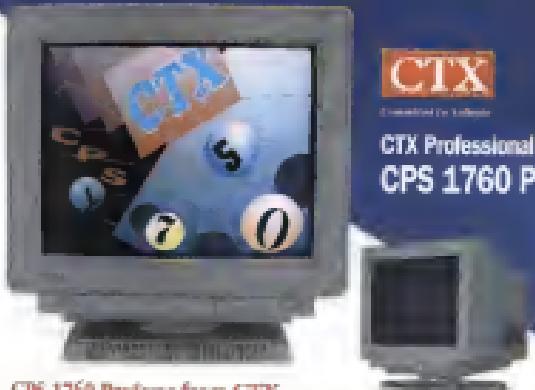
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IPC

What You Need To Know About Modems

By Parish Chou

Introduction

Buying and using a modem used to be relatively easy. Not so long ago, almost all modems were 1200 or 1440 bps. They were all compatible with one type of interface (although some were more "modem-compatible" than others). Now that has changed.

Today, modems is not only just faster, they are also loaded with features like error control and data compression. Additionally, not all modems talk all the languages. For example, V-42, V-44, VMEbus, LAPM, etc. What do they mean? And who do they belong to?

To make this mess of a high-speed modems, you need to understand three different kinds of protocols and the relationships among them. They are the standard protocols, error control protocols and data compression protocols.

Modulation Protocols

Modern modems use "modulation". Modulation is a method of carrying digital signals generated by the computer over analog signals which can be transmitted over a telephone line and receivers recovering analog signals in their digital equivalents.

The specific techniques used to encode the digital bits into analog signals are called modulation protocols. The most basic modulation protocols during the early years methods of encoding and the data transfer speed. In fact, you cannot have a modem without some form of protocol. It must either support more than one modulation protocol.

The one speed-like speed without data compression of a modem is determined by the modulation protocol. The highest speeds are achieved via direct modulation protocols at 1440 bps or higher. A 1440 bps modem uses data compression that can theoretically yield a 1600 bps throughput at not a high-speed modem.

"CCITT" is a French acronym that the International Telegraph and Telephone Consultative Committee (CCITT), a United Nations agency, is an international telecommunication standards committee that makes recommendations on a broad range of subjects concerning data communications.

2400 bps Modems

A 1440 bps VME-compatible modem typically supports the following modulation protocols:

RS-232C, V.23, V.24, V.24bis, V.24v, V.24v2, V.24v3, V.24v4, V.24v5, V.24v6, V.24v7, V.24v8, V.24v9, V.24v10, V.24v11, V.24v12, V.24v13, V.24v14, V.24v15, V.24v16, V.24v17, V.24v18, V.24v19, V.24v20, V.24v21, V.24v22, V.24v23, V.24v24, V.24v25, V.24v26, V.24v27, V.24v28, V.24v29, V.24v30, V.24v31, V.24v32, V.24v33, V.24v34, V.24v35, V.24v36, V.24v37, V.24v38, V.24v39, V.24v40, V.24v41, V.24v42, V.24v43, V.24v44, V.24v45, V.24v46, V.24v47, V.24v48, V.24v49, V.24v50, V.24v51, V.24v52, V.24v53, V.24v54, V.24v55, V.24v56, V.24v57, V.24v58, V.24v59, V.24v60, V.24v61, V.24v62, V.24v63, V.24v64, V.24v65, V.24v66, V.24v67, V.24v68, V.24v69, V.24v70, V.24v71, V.24v72, V.24v73, V.24v74, V.24v75, V.24v76, V.24v77, V.24v78, V.24v79, V.24v80, V.24v81, V.24v82, V.24v83, V.24v84, V.24v85, V.24v86, V.24v87, V.24v88, V.24v89, V.24v90, V.24v91, V.24v92, V.24v93, V.24v94, V.24v95, V.24v96, V.24v97, V.24v98, V.24v99, V.24v100, V.24v101, V.24v102, V.24v103, V.24v104, V.24v105, V.24v106, V.24v107, V.24v108, 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the CCITT V.32bis modulation protocol).

On the other hand, new V.32 modems can run at much higher than 9600 bps. They do just that in the form of the same modulation. That V.32bis modem can talk to such a target at 14400 bps. A V.33 modem can talk to a V.32bis modem at 19200 bps.

Things to come

Tel

CCITT is working on a new modem standard, called V.34. If all goes well, the 14400 bps standard can materialize before 1993. A V.34 modem is expected to reach a raw speed of 20,000 bps over standard digital telephone lines.

EDEN

In a sample of 3 years we may have several modems and digital telephone buffers (igital Telephone, DTE) that can handle 14400 bps. These will 14400 bps only because modems for the most part, in the short term, will support telephone connections. In the long term, it is expected that by the end of 1992 about half of telephone lines in the U.S. will have switches to ISDN. With ISDN you won't need a modem, they are in software, so dialing back will be interesting. You will need an ISDN adapter instead.

An ISDN line carries three digital channels, two "B" channels that carry bursts of data at 64,000 bps and a "D" channel at 16,000 bps that can carry control

signals or serve as a third data channel. A single ISDN line can transfer compressed audio/video data bidirectionally at 64,000 bps. Considering this kind of data compression scheme and you will be able to transfer data at thousands of bytes per second. Eventually, ISDN will provide widely available, high-speed digital communications for voice and data transmission. Until ISDN is firmly in place, high-speed modems will be with us for awhile.

Error-control Protocols

Besides high-speed modulation protocols, all current models of high-speed modems also support error-control and data compression protocols.

V.42 and V.42MP

There are two methods for error-control protocols: V.42 and V.42MP. The Microsoft Networking Protocol, MNP, is developed by Microsoft. V.42 is a more conventional protocol than MNP. It is a short compression protocol.

V.42 was developed by CCITT. V.42 is mainly designed for the recommended wireless V.42 and LAPM (Link Access Procedure for Modems) on the primary interface of a V.32bis modem. MNP is the original version. Therefore, a V.42 modem will be able to establish a connection to a V.42bis modem with a wireless link only if both support V.42. A modem that uses a proprietary modulation protocol may also have a non-supported error-control protocol.

For example, Hayes' CommandMaster 1040 supports an error-control protocol called LAP-B. CommandMaster is a V.32bis compatible protocol. Hayes' SuperModem Champ also uses a non-standard error-control protocol, V.42. A V.42MP can probably prioritize connections.

Modern wireless error-control protocols, such as IEEE 802.11b, IEEE-compatible modems, cannot provide error-free data communication. The noise and fading phenomena that are usually not taken into account in a standard telephone line, V.42 and V.42MP do not cope with the phenomena. The consequences for Hayes' not the last word, and necessarily commanding compressed data.

If you have a standard Hayes-compatible modem, you probably noticed some graphical characters. (Like "W", "A", "C", "P") show up on your screen from time to time. While these characters are displayed as error-controlled characters, they are not as here a reliable link and are capable of blurring out these graphical characters caused by the line noise. Notice that the last word is still there, it just does not show up on your screen or on the screen on the receiver system.

The filtering process used by V.42 (and IEEE 802.11b) is similar to the error correction scheme used by the error protocols (such as V.42MP). The main idea of this error correction was to implement a loop that makes sure that a certain number of data bytes match the data bytes. If there is a discrepancy, the data is erased.

With a little difference between error-control protocols (such as V.42, and IEEE-modem protocols such as RLL256), for one thing, the error-control protocols provide error detection and correction only during the transfer. The error-control protocols do not provide any error control when you are reading random messages or viewing your entire printout. In other words, an error-control protocol is "on" all the time during your online session and the error-control protocols are "off" only some of the time. Usually when you are sending or receiving through an error-controlled protocol, it "on" all the time, it will need IEEE-modem protocols when you are reading random files.

A reading mode like screens, drawing and fonts, it does not implement what a file. When you download or upload a file, your communication interface needs to take care of the details related to the file. However, the file size. This is handled by the IEEE-modem protocol which does most of the error checking.

Some IEEE-modem protocols, mostly IEEE-1471 and IEEE-1473, were developed to handle file transfer without performing any error checking. The idea of using a protocol like IEEE-1471 to eliminate the overheads that happens during the transfer speed. Therefore, IEEE-1471 should only be used with modems that provide no error-control protocols.

These IEEE-modem protocols do not provide an error detection or recovery capability. If a problem comes during the file transfer, the transfer session will be started. Protocols like IEEE-1471 or

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function depends on the modulus to provide correction for the migration of data being transferred. However, you should know that a suitable link between two modems does not guarantee guaranteed data integrity during data transfer.

When you call a remote computer, does one really check links involved in the process besides the link between the two modems? There is still one link between your computer and your modem and another link between the remote modem and the remote computer. When no problems occur in a reliable connection using V-42 or MNP 4, it only reflects integrity between the two modems. It is assumed it is still possible for errors to occur at either end between the serial port and the protocol (in the cable) or in the connection from the computer, until such time as V-42 or MNP 4 is used.

For open connection, you may still want to use a transmission protocol such as Xmodem, which also performs error checking over V-42 if you have a reliable link with the remote system.

The other benefit of V-42 (or MNP 4) is that it can improve throughput. Before reading the claim as a remote option, a modem with V-42 (or MNP 4) considers the data rate per port and during data transfer it is able to reduce the size of the data by stripping off the error and sync bits.

A claimant typically takes 2 times his, 8 times his and 16 times his the speed of V-42. Since no one would be a reliable link using V-42 or MNP 4, the resulting transfer rate is the same as using the packet interface of the serial port, and sends the data to the other end. The throughput problem that reduces the rate and improves the quality of the data in the remote connection.

Therefore, even without compressing the data you can expect to see a result as 1120 characters per second on a 9600 bps connection. Although the average reduction is 20% of the data, the speed increase is 16 times this 20% due to the increased accuracy by the compressed protocol.

Are MNP4 and V-42 useful?

Absolutely anyone who has ever used a standard modem can appreciate the benefit of an error-free connection. And the increase in data throughput, though modest, is nothing to sneeze at.

Data-compression Protocols

Before we move on to details of various high-speed modems that support data-compression protocols, let's review the existing modems will compress the data on-the-fly and the recovering modems will decompress the data in real-time.

MNP4 and V-42

There are two methods for data-compression protocols: MNP4 and CCITT V-42. Most modems also can programmed to accept multiple compression protocols. A modem can accept both compression methods calling an all-service-oriented protocol, although it is possible to have a modem that only supports an error-correction protocol but not any data-compression protocol. A MNP4 modem requires MNP 4 or error-corrected protocol and no data-compression required.

One note about V-42: In fact, many MNP4, V-42 modems also support MNP4. However, usually all high-speed modems that support CCITT V-42 also also incorporate MNP4.

The maximum compression ratio is a MNP4 modem can achieve is 2:1. That is to say, a 9600 bps MNP4 modem can transfer data up to 18288 bps. The maximum compression ratio for a V-42 modem is 4:1. That is why all these V-42 modems manufacturers claim that their modems provide strength up to 38400 bps.

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About Modems and Faxes

Modems

and *Faxing* [Part 1 of 2]

Don't be fooled by the claims. It is extremely rare that you will be able to obtain rates as low as 300 bps. In fact, V.32 and V.32bis are not very useful when you are downloading files from online services. When you will be able to obtain rates as fast as 1200 bps. In general, you will be able to achieve rates like speed (but transferring a standard text file) (but the rate you are reading right now). Downloading by 10 Kbps means that you can double click throughout the file or take a 1000 bps modem to effectively transmit 1000 bps. V.32bis and V.32modem compress a file which is already compressed by software. In the case of M8800, it will even try to compress a compressed file and actually expand it. That's what drives the "Beaver."

If you have ever downloaded files from a BBS or online service, you know that almost all files are in a compressed format. Therefore, you should always download compressed files. Even though the transfer rates are same (throughput 1000 vs 1200 bps), the V.32/V.32bis modem will appear to offer throughput "up to" 1600 bps. Most PC files are in the ZIP format.

Standard files are typically in the ASCII (text) or CPT (Compu Pro) format. Both are usually in the 1000, 1200, 1440 or 1600 bps. Note that CPT is also also in a compressed format.

Compression by Software vs. MNP-V.32bis

There are several reasons why compression software programs such as PCZIP or Shredder appear to be better than V.32/V.32bis.

1. Compressed files use disk storage space.
2. Compression software programs still need memory. Even if there is more free memory, then it is better to use a compressed file because it takes up all the RAM that you have available.
3. Software compression is more efficient than hardware compression.

In the case of a small file, this may not make much difference. For the difference can be significant when you are transferring large files.

On-the-fly modem compression does have one advantage. In some environments, you need to use software compression at first and then the modem does not need to decompress the file.

Local Area Control and Data Networking

To get the most from a modem with data compression, you want to send data from your PC to the modem as quickly as possible. If the modem is idle and waiting for the computer to send data, you are not getting the maximum performance from the modem.

For example, you have a V.32/V.32bis modem and you want to send a file for a remote system which also has a V.32/V.32bis modem. Let's assume that the modem is idle at least 1000 bps. By using V.32/V.32bis or just compression to sending data to your modem at 1000 bps, the modem will have to stop and wait until the computer has sent enough data. The problem is that the computer, you want to use the computer to send data to the modem at 10000 bps. This is where local area control comes in play. A high-speed modem typically supports two kinds of local

area control. Local area networking (ATM/Ethernet) and balanced communication (SCCP/X25/LLC). Of the two, balanced data control is the preferred method. We have mentioned earlier that there are three links involved when you are connected to a remote system:

1. The link between your computer and your modem.
2. The link between the modem and the local area network.
3. The link between the remote system and the remote computer.

Local Area Control

It is used for the first and third links. Notice that the first link requires the same kind of flow control as the third link. Local area control (or balanced data control) works by sharing usage levels on the ATM (Asynchronous Transfer Mode) and CTI (Common Transport Interface) local interface between the computer and the computer ATM is used by the modem on the sending end of the connection.

However, this is a problem. Since your computer is sending data faster than the modem can handle, there needs to be some way for the modem to tell the computer to stop sending data. Otherwise, data loss is sure to occur. This is where local area control comes into play. A high-speed modem typically supports two kinds of local

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1.544Mbps Hard Disk	Printer 4800	\$199.00
1.544Mbps Hard Disk	Printer 7200	\$199.00
1.544Mbps Hard Disk	Printer 9600	\$199.00
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1.544Mbps Hard Disk	Printer 120000000000000000000000	\$199.00
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1.544Mbps Hard Disk	Printer 200000000000000000000000	\$199.00
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1.544Mbps Hard Disk	Printer 2400000000000000000000000	\$199.00
1.544Mbps Hard Disk	Printer 3200000000000000000000000	\$199.00
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1.544Mbps Hard Disk	Printer 9600000000000000000000000	\$199.00
1.544Mbps Hard Disk	Printer 12000000000000000000000000	\$199.00
1.544Mbps Hard Disk	Printer 14400000000000000000000000	

modem buffer is almost full (a high-speed modem typically contains a small amount of space which is used to provide data buffers). The computer will then suspend data transfer.

Once the local modem has completed its buffer by transmitting data to the remote modem, it will switch off the serial port. This is used by the computer on the receiving end of a transmission. When the computer cannot accept data in the buffer which the modem is passing data, it will disable both the computer's serial ports when it is ready to receive incoming data from the remote.

Software has been designed to implement handshaking by understanding control characters in the data stream. XMODEM and KERMIT are the most commonly used control characters. XMODEM is also known as CompuCom or ZMODEM. XMODEM is based on CompuCom or ZMODEM. The XMODEM protocol is a simple file transfer program which is binary file transfer. CompuCom is probably the best example of a binary file transfer. It is not file transfer protocol (FTP) or Gopher nor part of the transmission.

Modem and High-Speed Modems

If you're a Macintosh with a high-speed modem, you will need a high-speed computer with a standard serial port. The serial port can have PCMCIA card fitting, a memory card slot, or a SCSI port. If a SCSI port is not good enough for you, the SCSI may be the only answer.

MS-DOS or any other multitasking environment, you should upgrade your PCMCIA with the 14000 bps V.32bis modems already being used.

The 14000 bps UARL has a 16 bit IEEE488 port, so this will help in preventing degradation when several programs are running at the same time. If you are an MS-DOS user, the UARL is in your computer tower on the backboard or on the SCSI card that has the serial port.

If you are using a Macintosh, the SCSI port is the solution. Both Infrared and Parallel Port modems can use the 14000 bps UARL. The Teletronics 14000 bps is 14000. The CompuCom/Xmodem/CompuModem/Champ, due to its unique design, does not use a standard UARL.

Even if you have a 14000 bps UARL, the communication software does not yet exist to support it. Fortunately, the more recent versions of popular communications programs are designed to support the 14000 bps UARL.

Hayes (Reinvented Serial Party)

Hayes makes an adapter called Enhanced Serial Port (ESP) that has two serial ports compatible with a standard computer. The ESP can have two PCMCIA card fitting, a memory card slot, or a SCSI port. If a SCSI port is not good enough for you, the SCSI may be the only answer.

Buying a High-Speed Modem

The V.32 and V.32bis modems are clearly the products of high-speed modems today. You should buy a V.32 or a V.32bis as a minimum.

1. Your application requires a high-speed modem with a proprietary modulation protocol. In this case, you should consider a dual-port modem that supports both the proprietary protocol and V.32 (or V.32bis).

2. You cannot afford a V.32 modem. In this case, your only choice for a high-speed modem is the CompuCom/Xmodem/CompuModem Champ. Should you pay the extra for a V.32bis modem? A V.32bis modem is faster than V.32 modems but it also costs more.

Should you pay more for the speed difference?

This depends on two factors: what's the price difference, and how do you want to use the extra speed in operation. If the price difference is less than \$100, then buy the V.32bis. But when the price difference is higher than the cost of the modem, it's better to support V.32bis. A V.32bis modem will pay for itself rather quickly if you are placing lots of distant calls to the remote system. However, it may be more cost effective to use some packet-switching networks to reach the remote system by calling a local number. A V.32bis modem will be forced to use some of the packet-switching networks currently supporting V.32bis. In fact, they are just starting to offer 14000 bps access lines.

Should you keep a modem with a proprietary modulation protocol?

With the exception of the CompuCom/Xmodem/CompuModem Champ, generally it is a good idea to purchase a modem that only supports V.32 or V.32bis. If you are using a Hayes card in a Macintosh, then use a proprietary modulation protocol; you should consider getting a model that supports dual modulation protocols (IBM Centronics Board Standard, Hayes 1400 or 2000, Hayes Ultra).

Should you buy the SpeedModem Champ?

I sincerely hope each user that uses the Infrared/parallel port V.32 modems to do the same today.

Assuming that you are not calling anyone with a V.32 or a V.32bis, then

Champ modems, should you use the money and buy the Champ? Unfortunately there is no direct answer to the question. The answer again depends on how you are going to use the various services. If you want to reach the remote systems via a packet-switching network, the CompuCom/Xmodem/CompuModem Champ may be a good choice. The CompuCom/Xmodem/CompuModem Champ is generally not supported by PCMCIA card fitting modems. The only company that supports the CompuCom/Xmodem/CompuModem Champ is CompuCom.

As a result, you will only be able to connect to 14000 bps with the packet-switching network. You would then need to place a long distance call if you want to communicate with 14000 bps.

Should you buy a 14000 bps modem with V.32bis?

If you are thinking of purchasing a 14000 bps modem with V.32bis, then I would suggest that V.32bis and V.32 are useless for downloading compressed files. These are now easily copied with 14000 bps with V.32bis is generally not useful when you are calling CompuModem or similar services or 14000 bps services such as Hayes 1400 or 2000, or separate phone numbers. Most of these services support V.32, but not V.32bis, up to 14000 bps lines. Therefore, you won't be able to use a connection with V.32bis if you call a 14000 bps modem.

Should you call their 14000 bps modem? Well, not really. Standard cellular services as well as many business local operators typically do not allow you to use their high-speed modems with a 14000 bps modem. You won't be able to make a connection even if you try. I would seriously consider the CompuCom/Xmodem/CompuModem Champ instead of a 14000 bps modem with V.32bis. The CompuCom Champ will probably give you much more for your

Continued on page 58



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The following section contains three short exercises that you can complete on your own. After you have completed each exercise, go back and read the corresponding section in the text.

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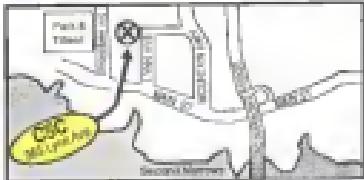
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- Targus 1600 VGA adapter card
- 12V Matl. power pack w/ 200Watt CEA approved power supply
- LED Display of CPU Speed
- Surround 2100A Monitor (1304 x 768, 8 bits, 16M colors)
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Newsbytes

Apple Canada Launches 7-Week PowerBook Promotion

MONTREAL, ONTARIO, FEB 7 (UPI)—Apple Canada finally has a promotion in the works. Computer experts, or so it seems at any rate, say Apple Canada is moving out to get the attention of potential PowerBook buyers with an upgrade price promotion of the PowerBook 100, the latest model in its notebook line.

From February 20 to March 21, Apple Canada is offering the PowerBook 100 at a suggested retail price of \$10,295. That is \$1,000 less than the regular retail price of \$11,295. The special price also includes the System 7.0.1 THINK! 3.0 update on the Macintosh operating system, and AutoUpdate disk management software.

In addition, company spokesman Jim Hirsch (Marketing and Newscorp), Apple Canada has arranged with a select network of resellers to make their products available at special discount prices when purchased along with a PowerBook 100. Apple dealers will be able to offer consumers discounted software discounts depending on their store choice.

Apple sold a total of more than 100,000 PowerBooks during its first full quarter, which ended December 31. No date is available for Canadian PowerBook sales.

The PowerBook 100 comes with 16MHz 68000 processor and comes with one megabyte of random access memory and a 30megabyte hard disk drive. An external diskette slot is also provided. The PowerBook 100 weighs 8.1 pounds. A sealed liquid-cooled battery provides up to four hours of non-battery recharging. Apple said.

Software: Apple's QuickTime audio package now lets users a great amount of hard disk space for compressing files.

Comments: Press Release, Apple Canada, 410-922-

881-1 John Street, Suite 1000, Toronto, Ontario, Canada M5C 1E6

Phone: 416-922-8811; Fax: 416-922-5944

New For Mac: Apple System 7.0 & 7.0.1 Tune-Up

Sydney, Australia, FEB 8 (UPI)—Apple Computer has released the last enhancement for System 7 operating system. The System 7 TuneUp improves several aspects of operation for users of System 7.0 and 7.0.1.

The TuneUp (not called a patch) enhancement involves the macintosh memory manager and repair memory problems in the user under System 7. A user does not have enough memory to run an application, and there is an application in use (not deactivate) a patch, the unused application will be terminated to free up memory.

The patch will also suggest updating from used applications or free up memory by switching to a new memory manager. The TuneUp removes the risk of disk loss from the simultaneous access of files. "PrintMonitor" logic is to make more reliable elimination of an occasional bug when disks were put in the "Trash". Improved SCSI (Small Computer System Interface) bus speedups and keyboards are now automatically scanned at start up to ensure they are recognized by the system.

The System 7 TuneUp is available from all registered Apple dealers, Apple groups, and bulletin boards. Price: dealers, \$12; Apple groups, \$10; BBS users, \$5.

Apple says the patch was developed and the price can be completed using the printer's "cancel" language.

For those printers with the font and audience limited to ROM, (read only

Apple Intros Beefed-up Versions Of Powerbook 100

CUPERTINO, CALIFORNIA, FEB 8 (UPI)—In a flurry of press conferences and a marketing strategy, Apple has announced two new versions of its popular Macintosh PowerBook 100 model notebook computers.

The two new configurations are to offer more power and flexibility to users. The new models come standard with four megabytes (MB) of RAM and a 40 MB internal hard disk drive.

The difference between the two new PowerBook 100 models is that one uses a standard floppy disk drive, while the other gets a hard floppy disk and a second power source.

Apple says the new PowerBook 100 configurations are an request by customers who have asked for more options in this lighter and less expensive PowerBook.

A low disk upgrade program is already in the works for the current PowerBook 100s. Apple said it expects to be able to offer the upgrades beginning in April of this year for consumers who want to exchange the 20 MB hard disk drive that comes with the PowerBook for a 40 MB disk. Apple says it expects to be able to drop the cost of the upgrade program soon.

Apple is offering price reductions also associated with purchases of the current PowerBook 100s such as 8MB of RAM and 10 MB hard disk. Back orders of the PowerBook were lowered in response to serial price drops of US\$100, or US\$111, off the PowerBook without an additional floppy disk drive and US\$111 for the PowerBook with an external floppy.

Interestingly enough, Apple says the reduction in suggested retail prices and reduced price consumers are paying. This is because Apple says it already reduced prices to its dealers in a special program last fall.

Comments: Press Release, Apple, tel 408-925-1514; fax 408-579-1156.

Apple Cuts Macintosh Prices

MARSHALL, ONTARIO, FEB 18 (UPI)—Apple Canada has announced cuts in suggested Canadian retail prices on many models of its Macintosh computers.

Price cuts are between nine and 27 percent, with the highest cuts in the low-end Macintoshes—ditto Choice II Macintosh LC and Classic lines. No price cuts were announced for the Macintosh II, IIx, IIcx and Macintosh 120, which the company says are "available indefinitely" in October of last year.

Comments: Press Release, Apple Canada, 410-922-8811; Fax: 416-922-5944; Internet: Apple@apple.com

The new prices are as follows:

	New	Old
Macintosh Classic (2048 KB)	\$1,449.95	\$1,799
Macintosh II (2048 KB)	\$1,649.95	\$2,499
Macintosh IIx (2048 KB)	\$1,849.95	\$2,799
Macintosh IIcx (2048 KB)	\$2,049.95	\$3,299
Macintosh LC (2048 KB)	\$1,249.95	\$1,699

In the U.S., Apple computer announced additional price cuts, including reductions of 10%, 15% and the lowest PowerBook 100, which was cut between 12 and 15 percent. The U.S. price of the SuperDrive printer was cut 23 percent, a 22 percent decrease in just under \$400.

Apple Plans Personal Digital Assistants For Consumers

LAKELAND, MICHIGAN, JAM 6 (UPI)—Apple President John Sculley, in his keynote speech at the Winter Consumer Electronics Show in Las Vegas, said that Apple plans to introduce consumer-specific computers by Christmas, 1992.

The new computers, which Apple is calling Personal Digital Assistant (PDA), theoretically would require very little skill and would fit on a specific electronic Apple line (such examples as electronic books, electronic organizers, multimedia players, electronic video cameras, display terminals, and personal computers).

Sculley said, "The enthusiasm from using a digital organizer spans all the way from a 12-year-old to a 90-year-old senior citizen and every age in between."

Apple has specifically mentioned plans for its QuickDisk (a randomly memory (252K ROM) desktop Macintosh system in one version, one for the consumer channels and one for the education personal digital computer market. Both products would use Apple's QuickDisk media (its technology, an example in the recent introduction of

the new iPhone T operating system, which allows the inclusion of voice, animation and music).

These computers were announced by Apple as its portable line of computers is planned for Christmas 1992.

"There is a long history of unexpected Macintosh entries showing up over time or once-implausible Macintosh spinoffs, so resulting in new ways ones should look at existing products," Sculley said.

Apple's introduction of devices may be the already-mentioned television as a day-day computer. Sculley also disclosed selling CDTV, and Polksoft reported Toshiba is planning a CD-ROM-based system that will work on a user's television set.

Apple's QuickDisk media (technology, as mentioned in the recent introduction of

Comments: Press Release, Apple, tel 410-925-1514; Fax: 408-579-1156.

Apple To Release Cross-platform QuickTime Toolkit

SAN FRANCISCO, CALIFORNIA, JAM 16 (UPI)—Apple has this week for Apple, so the company has announced a solid begin development of tools and utilities for cross-platform conversion of QuickTime movies, such as "Movie" file applications in different computer platforms. The Movie Toolkit is to describe the capability of the newly refined QuickTime, as mentioned in Apple's System 7.0 press release.

The Apple announcement comes a year after Microsoft released beta versions of its Multimedia Development Kit (MDK) on independent software developers (ISVs), including those developing on the Macintosh. The MDK beta release, released in August of 1990, included a Movie Converter Kit for creating QuickTime movies from Macintosh, Windows, and multimedia applications.

Microsoft representatives, Ray Bernickoff and Apple's Bill Gribble, said it will be possible to leverage the conversion they have made in Apple QuickTime-area products by bringing them over to the Microsoft Windows Multimedia Personal Computer (MPC) platform.

Apple's planned QuickTime Movie Toolkit for ISVs developers will support up to 100 different types of platforms, including Amiga, Corp. 32, Sun, IBM, and DEC computers. The kit will contain utilities to allow a developer and third parties to convert the multimedia applications, such as an animation in QuickTime. The completed conversion can then be distributed over a network or on a floppy disk.

The QuickTime Movie Exchange Toolkit will consist of the Apple QuickTime and Windows version of Apple's QuickTime for Macintosh (QTM) and QuickTime for Windows (QTW). The QTM version will allow the conversion of the MS-DOS and Windows movie, presentation, graphics, and audio files on the Apple QuickTime Movie file.

Apple says the software allows users to convert their captured motion picture material to compressed motion picture files for QuickTime on other platforms such as Microsoft Windows. Apple demonstrated a prototype of a QuickTime player for Windows in the Microsoft Windows Personal Computer MPC file.

Apple says the software allows users to convert their captured motion picture material to compressed motion picture files for QuickTime on other platforms such as Microsoft Windows. Apple demonstrated a prototype of a QuickTime player for Windows in the Microsoft Windows Personal Computer MPC file.

As a final note, Apple said its decision to use Apple's AUSX 1.0 scheduled to ship early in this year, will integrate QuickTime with the Macintosh.

Comments: Press Release, Apple, tel 408-925-1514; Fax: 408-579-1156.

Comments: Press Release, Apple Canada, 410-922-

881-1156.

MacWorld: Adobe Premiere Hit Of Show

SAN FRANCISCO, CALIFORNIA, JAN 14 (UPI)—Adobe's Premiere and Apple's QuickTime stole the spotlight at this year's San Francisco MacWorld Expo. Adobe's newest product, which allows you to create digital "movies" on the desktop, is changing how end users think about video.

The software builds the process of replacing complex and expensive outside video editing systems used in video production houses, but the software can also be used by individuals who have not all the tools put in place, according to Adobe. The main problem is a lack of machine memory. Premiere can now run on standard state-of-the-art Macintoshes or PowerBooks but requires 16MB to perform several successive video editing. It can be used, however, in postures offline editing, or the disadvantages of what can be videotape, and where none, should be introduced.

Adobe says, however, that the release of Apple's QuickTime is step forward, as most all additional inputs can confirm on one system.

Premiere is the latest addition of Department of Defense (DoD), a digital video-editing software product developed last year. Adobe acquired rights to the product in August, 1991 and has worked with Supersoft on its continuing development. Recently, Randy Ulmer, who developed RealOne, has been hired by Adobe.

The RealOne software was developed to make use of the Video Graphics Interface's (VGA) composite capture hardware boards, which were another hit of the show.

WorldFitter showed off its new version of Worldwide for Windows, with a digital video clip prepared with Premiere. Other graphics prepared with the product were in

evidence nearly everywhere, including the booth of a local business.

Premiere costs US\$495 when purchased alone. As a bonus price, however, is the bundled SuperMovie/Adobe desk. For a limited time, Premiere costs \$200 when purchased with the Video Splicer for the LG or II (S499) or the Video Splicer for Philips (S599).

Premiere allows users to combine video footage, audio recordings, animation, still images and graphics to create digital movies on the Macintosh. The product is built on QuickTime, Apple's own standard extension to System 7. QuickTime allows users to combine and synchronize sound, video and animation on the Macintosh platform so easily as if all files can be interchanged. Premiere displays tracks in "Storyboard" style, allowing the user to see different output for different source sources, special effects, anticipated output and more.

Adobe has the extension as a requirement for Adobe Premiere software on a Macintosh. It companion with four megabytes (MB) of memory (some memory RAM) and a hard disk drive. Adobe is issuing QuickTime version 1.0 extensions with Premiere—extensions which have only recently been released by Apple. Premiere also includes QuickTime version 1.0 for Laser as well and Adobe says a QuickTime-compatible, digital video capture board is recommended.

Source: Tom Coughlin, Adobe, tel 408 444-0440; fax 408-852-2200.

MacWorld: Panelists Debate Apple's Future

SAN FRANCISCO, CALIFORNIA, JAN 14 (UPI)—A lively group of distinguished panelists tried to second-guess the Mac's successional plan at a Macworld session of MacWorld San Francisco.

On the floor's recently announced plans to enter the consumer electronic business, Steven Cottrell, editor of Digital Media, reflected general opinion that Apple has to make use for it what it already has. "Apple is in Apple II, what else would that mean?" continued digital technology's vice president of marketing, Steve Jobs, chairman of the Consumer Electronics Show that Apple would be offering "TDAIs" or "personal digital assistants," as well as CD-ROM-based products of Macintoshes or the consumer market. In 1990, 94.42% of the new desktops are coming from the new original, rather than existing technologies.

The Tokyo-based analyst with Credit Suisse, suggested that Apple were going close into consumer electronics, as it does now in a company, "would tell." He added, however, that "Apple needs to establish a special division or seek with Sony to build PDA's." He suggested that Japanese firms already have consumer electronics expertise.

Cottrell agreed that Apple and the rest of the US electronics industry should stop wasting time reacquiring technologies that already exist, and should focus more attention on various consumers, namely Japan. Using Los Angeles as an

example of a poor approach to international expansion, he said it doesn't work in the computer business, "but it'll last."

The future of the Macintosh, although the consequence of this show and Apple right now appears to drift to Borwest and beyond, is still an issue of interest and publication of PC Letter. "The Mac today is where the Mac II was when the Macintosh was introduced in 1984." That was the start of the decline of the machine, as eight-bit computers which mimicked Apple's first significant innovation,owering how we've used computers since then. Also yesterday, "There are probably people in the audience saying 'what's in Apple II?'

He said Apple will most likely not support the Macintosh much longer, a new operating system, and a hybrid machine being created with IBM. Dan Reiter, editor of MacUser, and his doubts Apple will ever be the Macintosh as a machine "with legs" and that the Macintosh II will probably reach the market, but only when the base model, reflecting today's Macintosh Classic, is a hybridized machine.

Apple's recently announced liaison with IBM, supported by the government, does the same thing. "If they can pull it off [the alliance] we step into a paradigm shift that will leave most of us in the dust"—especially those of us who like to type. Dan Farber, in a comment which drew a few laughs, Farber provided the motivation behind the alliance, explaining that Apple and IBM are trying to catch the Macintosh market share dominance in the industry with its Windows interface.

He concluded that despite the talk about the two companies' corporate and cultural differences, they are "more alike than they're different."

—Wendy West

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New For Mac: Anatomist Teaches With HyperCard

GRANTHAMS' LANDING, B.C. JAN 7 (UPI)—Followme Design has announced Anatomist, a human anatomy teaching and reference tool, built around Apple's HyperCard database.

Anatomist incorporates illustrations, speech, reference text, and personal anecdotes in a hypermedia framework, the developer claims. It is based on material from The Human Anatomy Coloring Book, by Wynn Kapit and Lawrence M. Elshin, Ph.D., and is designed to complement the process of studying book products.

Lorraine Blestwick, one of the two principals in Followme Design, and Mendyana Lee, her company's other main actress for the software, say their first is a medical education program. Following the success of anatomist, the duo is exploring public school curricula, and the third is the general audience market.

Commenting on the package's appeal as children, Blestwick said Followme gives the software to a number of schools for beta testing. "They had to kick their preschoolers off the machines to do their school work," she said.

The software includes more than 300 illustrations and more than 2,500 anatomical terms. It provides spoken pronunciations and definitions. It is available to schools on disk or tape.

Blestwick and Followme plan to market the software worldwide, and Lee had expressions of interest from North America, Europe, Australia, and Japan.

The suggested retail price is US\$99.95. Anatomist requires a Macintosh with two megabytes of memory, a CD-ROM drive, and HyperCard 2.0.

Contact: Linda Blestwick, Followme Design, 994-0942.

Apple Plans Aggressive Multimedia, CD-ROM Push

TORONTO, ONTARIO, JAN 24 (UPI)—Apple Computer is about to get more aggressive about promoting multimedia, according to Paul Wolfson, senior development manager for media integration and consumer products at Apple Pacific.

Talking to a group of journalists, Wolfson told Apple Pacific is adopting a policy of "CD-ROM partnerships," aiming to get many compact disk read-only memory players to partner with the house of consumers in the belief that they will benefit from a system that has delayed the introduction of multimedia.

Multimedia is the combination of data, text, video, graphics, audio/motion. It frequently relies on CD-ROM as a storage medium because of the large capacities needed.

Wolfson said that as disk storage developers have lowered its perabyte CD-ROM disk prices, he believes there will soon be few CD-ROM players in the race to make a major market. Consumers, meanwhile, have been buying the players because there were not enough titles to make them worth it.

Wolfson also announced that more than 100 new developer products will take advantage of QuickTime 2.0, a square software extension that allows Macintoshes, Macs to manipulate sound, video and television files more or less on their desktops and tools.

Packages supporting QuickTime include personal computer packages such as Apple's Performer and Video!; GEM-based education applications such as Art Pro, BrainBuilder, and BrainBuilder II; and Microsoft Windows-based processors such as WordPerfect and Microsoft Word, and new referencing products such as Apple's Encarta and Dell's ValueShop.

Contact: Press Relations, Apple Canada, 1100-HF-8811.

Apple Tops In Two Canadian Surveys

MONTREAL, QUEBEC, JAN 22 (UPI)—Apple Canada is coming out the results of two recent surveys that give its products top spots in both unit shipment and customer satisfaction in the Canadian market.

The latest Nielsen Marketing Research Index, which Nielsen Marketing Research measures personal computer requirements through mailers, said Apple was number one for the fifth consecutive two-quarter period, ending October 31, 1991. Nielsen named the Macintosh Classic the top-selling personal computer in Canada for the 31-month period since it was launched in 1989. The Macintosh IIci was second.

Earlier in January, J.D. Power & Associates conducted the results of their Overall Customer Satisfaction Study. One of seven 35 responses, printer and software brands J.D. Power gave Apple the highest user satisfaction rating based on a survey of nearly 8,000 business PC users in more than 4,000 sites across Canada.

J.D. Power's study rated products on a number of attributes related to user satisfaction, giving Apple highest marks on ease-of-use, support, capability, reliability and software friendliness, as well as overall satisfaction.

Contact: France Maglo, Apple Canada, 411-8181, 4100 Lakeside Drive, Suite 100, Mississauga, Ontario, L5J 1P5, Tel: 416-873-1795, Fax: 416-873-1794.

Bell-Andic To Provide Canadian Wireless Net

MONTRÉAL, QUEBEC, FEB 1 (UPI)—BCE and BellSouth Canada have reached an intercity data communications joint venture and expanded its coverage by linking BellSouth's private network, BSN, Canada, will be the largest customer of the newly formed Bell-Andic, formerly called Andicel.

In the United States, BCE and BellSouth are partners in the nationwide AT&T wireless data network. In Canada, BCE will own 51 percent of Bell-Andic, but will have a joint marketing arrangement with the company. BCE's subsidiary BSN Mobile is to own 49 percent of Bell-Andic and BellSouth Canada the other 40 percent.

BCE is the largest company of Bell Canada, Canada's largest telephone company, and Northern Telecom.

Alain Forestier, president and chief executive of BellSouth, said a planned news conference that the acquisition of BCE's private network would allow his company to expand its service from the central provinces of Quebec and Quebec to all of Canada.

The BellSouth network is now able to reach about 14 million Canadians. BellSouth and BellSouth companies and terminals can exchange data using existing standards and with unique protocols, making it a network. The BellSouth network is in the process of being expanded in the United States, which has more than 6,800 cities and towns, Forestier added.

James Morris, president and chief executive of BCE, and the management of BellSouth, "will add to us this wide range of technology that Bell already provides in this area." Bell's wireless communications interests include cellular telephones and paging services as well as telephone services via dispenses.

Audrey Smith, vice-president and general manager of BCE Canada, said wireless data communications will be important to many businesses. "We are rapidly," he said, "the current and future source of many businesses for an information marketplace."

Bill Ellingsham, president and chief executive of BSN Canada, said his company

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began using wireless communications about four years ago to help its field service staff communicate. The system has resulted in about an eight percent improvement in problem-solving time and a 20 percent reduction in response times, Kishimoto said.

Ericsson and IBM Canada chose to sell its private wireless network to BellSouth and later to its parent company because it will provide services "so that we could concentrate on our core business." A marketing agreement with BellSouth also allows IBM Canada to offer the service to its own customers, Kishimoto added.

Complementary to its mainframe, IBM Canada also launched the subsidiary in Canada of the Phoenix, its networked computer, in November 1990. -John M. Thompson. Under an arrangement with Bell-Apple, IBM will sell the PC-line with industry-specific wireless applications and integrated services, along with access to BellSouth services.

BellSouth will charge for the use of its network at the rate of eight cents per packet, regardless of the distance over which messages are transmitted. Premium and a round-trip usage charges will probably be in the \$2.00-\$2.50 range each month.

Along with IBM Canada, BellSouth has signed on Dan Kishimoto of Ontario Hydro, a power utility, to evaluate cellular technology for its needs.

Bell South also announced recently partnerships with 10 companies that will sell products able to work with its network. Besides IBM Canada, they include Computer Logistic, Englewood, Ill.; Teletechologies (a Bell Canada offshoot); Irvin, Lexington, Mobile Computing, Poole Computer, Service Systems International, Shreveport, Telxon Canada and Toshiba.

Contact: John Kishimoto, Bell-Apple, 412-361-0700; Bob Treadwell, Ontario Hydro, 416-497-1467; Dan Kishimoto, Ont Hydro, 416-497-1467.

COMMODORE NEWS

C64: Defender of The Crown II Debuts For CDTV

LAS VEGAS, NEVADA, JAN 18 (UPI)—Commodore's CDTV, a compact disc player for home entertainment, has loads up to a television, looks like a stereo, records video and computes directly with Philips' CD 2 processor, and some impressive titles on display here at the Consumer Electronics Show. One was "Defender of the Crown II" by software vendor/publisher Jim Sachs.

The quality of the appearance of computers that claim to have a grand total of 32 bits seems to have a developed and well-defined look. The most distinctive of the CDTV II games is done all out with the Commodore CDTV's capacity of 1.44MB.

Sachs, a retired military pilot, is a "hero" well known in the Commodore industry when it comes to developing games with superior graphics and music. Sachs says with develops games and tends to go with them for the Commodore Amiga and CDTV. His machine courses is hard to do so.

Sachs and Petrecca say "Defender of the Crown II" is a mix-and-toss the original Defender package, fine dumbed for the Amiga.

"I was able to take all the stuff that passed up on the cutting room floor from the first 'Defender of the Crown' and use it here," Sachs said. But the second version doesn't look like a stripped-down regular version of the first game.

The graphics are fascinating and the game is intriguing and complex. In the year 1990 in Europe, the object of the game is to earn 30,000 pounds sterling to get Richard the Lion Heart back from Empress Agatha. The game is very deep and requires memory, attention and speed play.

The game appears to be well-designed and the animation is fast and engaging, bringing graphic effects, like a shadow of a

lions on a horse running across the screen are actually simulations to give the audience time to load another segment of the game.

When asked how long it takes to set up the game and get it going, "it takes me three days," I don't play them," he said. "Actually, the game goes in a computer, though it may not even be playing yet."

Available in five languages, German, French, English, Italian, and Spanish, "Defender of the Crown II" is expected to be available this Spring and retail for \$39.95.

The CDTV player retails for 15%, but is expected to drop in price quickly, Petrecca said.

Books is scheduled to attack another sector on the Queen May in Long Beach at the next AME Expo, focused on the Commodore Amiga computer and software packages. Books is a division of World Wide Marketing, which also owns the AME Experience, the country.

Books Inc. (Books), Commerce, Tex 76024-4995, Fax 214-824-1995.

GENERAL

CES: Show Overview—

Computers as "Appliances"

LAS VEGAS, NEVADA, JAN 14 (UPI)—Consumers will be using computers and electronic devices in their homes more than ever before, according to the Winter Consumer Electronics Show trade show.

Smart consumer electronic products that are becoming more and more like computers, however look like slightly different versions of ordinary household items, such as telephones and televisions. AT&T Telephone is a good example, with the telephone and the Fax Home Theatre.

Apple Product John Sodini underscored the company's interests in CDTV 7000, (personal digital assistant) devices for the consumer market which will be displayed alongside mobile multimedia computers.

However, other names were taking center stage. A new piece of computer equipment between the remote control unit of the television and the personal computer, the Home Recording Rights (H.R.R.) was being showcased in a press conference by the Home Recording Rights Coalition. Companies were being invited around the show by H.R.R. representatives. H.R.R. is slightly aligned with the RIAA.

The H.R.R. was actively seeking consumers as the show is set to their directed interest in personal computers the Home Recording Rights (S. 1018/H.R. 2256), a piece of legislation which becomes consumers, renters and manufacturers responsible for personal, non-commercial use of recording media, recording products would pay a modest royalty or a special fund for copyright owners.

The bill is aimed at digital recordings only, (CDs, recordings and cassette) and could have an effect on the computer industry as well, passing the way for consumers to be able to copy software for personal, non-commercial use.

In the city of games, Nintendo and Sega were competing with Mattel in very high gear. Nintendo had dominated the日本 market and had a 1989 sales total which was 100 million units. Another Mattel product from third-party developers showed and players basically conserving on video game were everywhere.

One of the most fun and intriguing displays was a realistic animation display of Mario from the Mario Zone, who called on and called with, characters from a television screen. Mario would call in a personality who would host, and award cash. The State estimates directed the participation in the television series. The Mario character was just the host, but a model, laughable, dressed, and interacted with attendees just like a real person. In fact, Mario said several attendees had "real" TV looked.

The newest in Mario is called "Digital Popcorn," which allows a human operator

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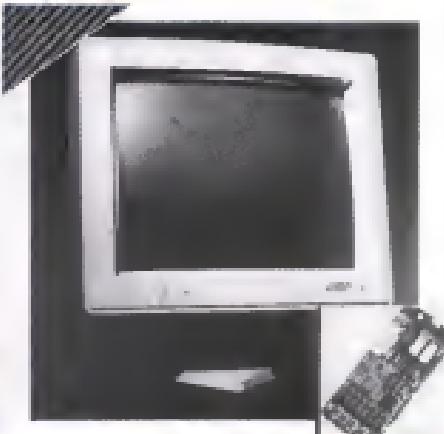
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Other Options	16 MB memory, Video Processor Low Profile power distribution board Support ROM modules in all connectors



DATA 32 WORKSTATION PROFESSIONAL BASE

Processor	33 MHz 386DX
Memory	1MB DRAM
Monitor	100% NTSC (Analog)
Front-User Controls	Power, Monitor Bezel, Control, Register
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Windows & OS/2 Show:**Jerome Burke Keynote**

SAN JOSE, CALIFORNIA, JAN 29 (UPI)—Multidisciplinary engineer and keynote speaker Jerome Burke had his salutes saluted exclusively by Microsoft employees at his keynote speech at Windows & OS/2. His audience here was just. In reply to a question as to whether he thought the computer industry was dominated by vested interests such as Microsoft and IBM, he replied, "not for much longer."

The "second浪潮" question came in a result of Burke's interesting keynote speech which bell reverberated around the room. "I plan I made it," he said, "to signal that Microsoft has no monopoly." He cited several technologies from other companies combined to make a third. It Burke had also argued that "Microsoft" and "Intel Standard" had basically condemned the development of innovative thinking.

Speakers also asked Burke if he did not think that the computer industry was just another industry, to which he replied that "the computer industry is different."

In his speech, Burke said he sees multimedia technology as a continuation of the trend away from "paper media." Also, he said that individuals have more choice, and education is a way to give it to them. New technology, he said, will allow everyone to have their say.

Specifically, he said, multimedia is a way "to rapidly educate the electorate." One of the major problems for multimedia, he said, was in education. "Interactive programs," and books "will already revolutionizing education," he said.

But Burke, in his speech, "In general, perhaps the most important aspect of this new technology might be that it can increase the acceptance of these ideas and ideals in action." Encouraging, he said, "is a key commodity for the individual." With unrestricted access to a range of information sources, people will use the technology for something in life," he said. "If you give people unlimited and unrestricted access to knowledge, or much else, and to the software that will teach them to use the resources to their own educational ends, and through the network, resources from the community of place and time, then the society that they live in will be held back for certainities will lose their importance, and with them will go the educational ambitions."

Concluding his talk with Neumann, Burke said that he was "very optimistic" about the future of the industry.

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Windows & OS/2 Show:**What's Hot and What's Not**

SAN JOSE, CALIFORNIA, JAN 29 (UPI)—One of the more interesting revelations at the Windows & OS/2 Expo in San Jose was the "Who's Hot and Who's Not" in computing. The panel featured industry experts David Pease, Bill Gammie, Randy Dugger, Michael Miller, and Brian Morris, each giving their own top "Hot" and "Not."

Hot topics got the most press in time to keep the participants in the plenary meeting over Microsoft's "World For Windows" 2.0 word processing software, although the report indicated that was not unanimous.

Not so hot were

Windows 3.1.

What's not was given a "top 10" mention (just under "Not"). The first feature on the list was the file format being in 5.1, which is the same as the Intel DOS version, the keyboard template having loads DOS as Windows, having a bottom line with big, readable buttons and a good file manager that can be run even in Windows 3.0.

Other "Not" award winners included Microsoft's True Windows 3.0 graphics interface, Apple Computer's PCDOS for Windows, which offers compatibility with many other computers; German firm Software's Beach OS, the Thindisk equivalent for Windows, and mouse ports with common error detection as a sort of class above the specific applications.

The "hot" that sprung to mind were the Zilog Windows spreadsheet, and Texas Instruments' graph down software, according to the panelists, the company brought out the product for multiple platforms at the same time and did not take a license from Microsoft's version of Windows properly.

There also got a "dismal" nomination. The panelist seemed to think the product was a cross between a drawing program, a spreadsheet, and a database. Definitely, the panelist called Texas as "interesting mental exercise," although he was "not sure who would use the product."

Speakers went to the Texas end again to Bill McGrath, who said that the product was based on "spreadsheet users" who tried to visually represent their data.

The analysis concluded with a brief description of Windows 3.1, although, encouragingly, no one mentioned if this was a "hot" product, or a "not" product.

Windows & OS/2 Show:**MicroSoft Demos Windows 3.1**

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Windows 3.1. However, the article in the paper had received a change, which gave in to the Apple decision, which was to make data files out of the product's code itself. This means that Application Errors directly points to the source, though well in the particular document.

These preliminary reports, had they stayed, would have been a brief demonstration of the new File Manager, which now allows both the text and a directory to be read at the same time on the screen. It also allows for multiple windows to be opened simultaneously.

Speed improvements are not to be a major feature of 3.1, along with improved "file handling," "mouse support," and more "user friendly" user interface. The PC industry's new leader, Giga Systems (holding out until April) also gave a lightning presentation that "allows users to create copy-and-paste documents," according to Miller.

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New For PC:**Illustrator For****Windows**

MCATTAKE, VENUE
CALIFORNIA, JAN 25
(415)-Adobe Systems
has announced Adobe
Illustrator 4.0 for Microsoft
Windows.

The Windows version of Adobe Illustrator is very much like the Macintosh version, and like the Macintosh version it grants instant professional illustrations.

Adobe has now brought in the Windows version including editing in pixels mode, improved grouping capabilities, improved color support, online, comprehensive help, magnify tools, and import and export for support. The company says the time it takes to load files has been significantly reduced in the new version and the software has been updated for performance with Intel 386 and 486-based systems.

Adobe is offering in Adobe Photoshop 2.0, Adobe Type Manager (ATM), Adobe TypeTool, and Adobe PageMaker software packages. The software supports PostScript, graphics, images, spreadsheets, and databases. The Adobe Collection Editions with the new version 4.0 of Adobe Illustrator 4.0 for DOS. The Photoshop 2.0 product will only be available with Adobe Illustrator 4.0 for the few days after its release, the company added.

Adobe Illustrator will be available in the second quarter of this year from authorized Adobe dealers.

Microsoft To Certify PCs for Windows:

SEATTLE, WASHINGTON, FEB 5 (UPI)—For some years now client makers have advertised that PCs are "IBM compatible," but that standard could soon be obsolete.

Microsoft Corporation has announced that it is offering the IBM hardware suppliers whose PCs run Windows programs the use of a "Windows certified" logo. The offer includes IBM. If the offer is universally accepted by the manufacturers, the critics can change to "Windows compatible."

Microsoft says the logo can be used to certify that a manufacturer's machine runs Windows included software.

"The concern involved is no longer do IBM because the IBM machines are not even compatible with Windows," said Roger Work, marketing manager at Microsoft's systems unit.

Microsoft said it will hold a conference for personal computer makers in San Francisco March 13 to talk off on how to make Windows compatibility the industry standard. "We think Windows is becoming a very strong and powerful leader for our industry," says Work. "They work on Windows compatible and they look for machines that run Windows very well," said Microsoft spokesman Barry Tandy.

Microsoft says it has already signed up three well-known PC makers: Digital Equipment Corporation (DEC), Tandy Corporation (Radio Shack) and Dell Computer—so well as several others.

The Windows certification program, for instance, has the potential to widen the chasm between former allies Microsoft and IBM, current when the two giants were synonymous. In 1989, Microsoft signed with IBM, which IBM hoped their OS/2, promising it would "Run Windows better than Windows." That notion of OS/2 is expected to fade, while Microsoft is expected to enhance its own

version of Windows, Windows NT, about the same time.

Somewhat earlier, however, than IBM now has only 10 percent of the nearly \$20 billion worth of IBM-compatible personal computers that sold in 1990.

An IBM spokesperson said that IBM is also removing the use of an OS/2 logo, noting what misleading opinions. He said IBM has been working with Microsoft to have more manufacturers to gain broader acceptance of OS/2.

"What's important to consumers? It's important [for the hardware] runs Windows. That's our position on it," said Work.

Contact: Microsoft Company, 47-1000-0001.

Spreadsheet For Windows Wars Continue

ACOTTS VALLEY, CALIFORNIA, JAN 31 (UPI)—In a friendly competitive garden, the major software companies producing spreadsheet—Lotus, Borland, and Quattro Pro—have come to battle at the software in the Windows environment. In the latest round, held at the Design '92 show in San Jose, California, Borland and its Quattro Pro for Windows product, will be put through its paces.

Borland and Quattro Pro for Windows was compared against Lotus 1-2-3 for Windows and Microsoft Excel 4.0 for Windows in three categories. The three categories were basic data entry and

formulas, graphs and printing, and macros. Quattro Pro scored higher in the first and second categories and tied in the macros category.

Quattro Pro for DOS has been doing well against Lotus 1-2-3 for DOS. The Foundation IBM Computer User Group, one of the largest IBM user groups in the U.S., had both products in last year for a "show-off" under the code and because by demand, and said the Borland product sold hands down.

It is in fact in the mode of a "Rock-and-Roll" war against Borland in regard to our status as the Quattro Pro for DOS.

Continued on page A1

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WEEK

Doing it Right: Quicken 3.0 for Mac

by Joe Wheeler

In the August 1990 issue of *The Computer Paper*, a review of Intuit's Quicken version 2.5 for the Mac described the program as "primarily an electronic checkbook register-based personal finance package with cheque printing capabilities." Quicken 3.0 has now added functions that make the program quite useful for small businesses, including sorting, report generation and export capabilities, report

generation, accounting packages such as Blitz and Excel. The program was also enhanced for not having a "Macintosh" interface, so that users can select banking, a library HyperCard card for viewing line readings with cheque graphics, a mission menu and gone suddenly on configuring the software for printing or nonapple printer.



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Major Improvements

With the new version 3.0 address these concerns...you have your own bank, and much, much more. The user interface remains much the same for those of us used to current versions, but whole changes make the program more accessible to the new user. One new feature is the new "New Chart" in a double-clicked ledger header. This enhancement under the Options menu allows users to generate more features, configuring printing as practically any printer is a label and provides choices for an on-line help feature with good topic and sub-topic organization, instant file search for the moment, and, was a change to the menu bar, give you some Macs of the changes, the holes of the previous version's manual were eight pages, and the new manual spans sixteen pages. Overall, the program is better organized, the writing is cleaner, and many bugs are fixed. If you're a power user, you'll find much to like here. You would expect other data, such as there are a host of new configuration options, e.g., deactivating whether the return or tab key moves you from field to field, set the time formats to display and print, the Canadian currency symbols, and set a "Followed" to remind you of past due cheques and scheduled transactions when you switch from one program to another.

Significant New Features

Finally, Quicken has a brand new cash flow based account. Now you can keep track of credit card, stock portfolios, and investment accounts, as well as real estate investments. In addition, the program has added the ability to "split" the contributions of a particular item, so for example if you are a small business owner who pays your self for both personal and business expenses, you can record which portion of a payment are personal and which are business, and even where expenditures for IRS and personal record-keeping those dimensions belong. There, while divided, you can pass on the information to your tax accountant. The final feature of note is the addition of four financial reports that reflect the new dimensions. Budgeting, savings, spending and receivable, balance sheets, cash flow, payroll income statements, profit/loss, transaction summaries, all of them and more are readily available by a single menu selection.

What it comes to point summed: At \$100 or upgrade \$25.00 (U.S.) Quicken should pay for itself in days. **CW**

Joe Wheeler is Director of Developed Economic Services and a computer and media consultant in Phoenix, AZ.



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NeXT Heralds 400+ Percent Growth, New Products

SAN FRANCISCO, CALIFORNIA, JAN 24 (UPI)—NeXT announced it is experiencing an unexpected growth spurt, reporting a 400 percent increase in company's 1991 revenue last year. The company reported \$177 million in revenues for its fiscal year ending December 31, 1991.

Steve Jobs, co-founder of Apple Computer, Inc., and current president and chief executive officer of NeXT Computer, said, "Our 1991 results are a solid example of our 1991 strategy." He added, "especially given the worst technology environment in memory," Jobs gave the keynote speech, appropriately, at the NeXTWorld show in San Francisco on Wednesday.

Jobs said NeXT has had an significantly better year than average cost-controlled companies like IBM. "We've been fortunate to have strong sales from the U.S. and every part of our software, in part because it allows customers to reuse custom applications up to 10 times faster," Jobs said.

NeXT and the increase in revenue is due in part to the company's change in marketing focus from higher education in 1990 to business and government customers in 1991. NeXT also sold 45 percent of its revenue last year in European and Pacific operations. The company is projecting half its revenue will come from outside the US in 1992.

Third party applications for the NeXT are increasing in numbers as well from 80 to 247 during 1991. NeXT user groups went from 85 in number to over 200 groups in 30 countries, the company added.

NeXT also announced new products, including an operating system for the PowerPC-based computer.

G + C + d

NeXTware 400, the operating system is open-source and is the same operating system offered on the

Mac, the computer designed and built by Apple Computer. The NeXTware 400 allows NeXT and PC-based computers to interoperate smoothly with each other, as well as with Apple Macintosh.

Users were asked to wait for the new version more than a year ago until the missing piece of the NeXTware puzzle, a definitive agreement from the Mac folks to make available an interface.

Current NeXTware applications can be ported to the NeXTware 400 easily. NeXT and Lotus, WordPerfect, Adobe and Westview Research have created versions of their NeXT applications running in NeXTware 400.

The NeXTware 400 requires 6 to 16 megabytes (MB) of random access memory (RAM) and a cache or parallel drive. The

new version of NeXTware requires 160 MB of free disk space for use and is offered at a retail price of \$1695. The developer version, which requires a 450 MB of local disk space, is being offered for \$2,995.

NeXT has also announced three color versions of the NeXTstation which the company says are also less expensive. These "turbo" versions of the NeXTstation, NeoTstation Color and NeoTstation are built on the Motorola 68040 processor running in 33 megahertz (MHz).

Jobs showed three new "turbo" NeXTstations were based on the Motorola 68040 chip, set at 25 MHz. NeXT said the color computers have been sold in 20 million computers per second (MPS), compared to 16 MPS for the 25 MHz models.

NeXT and it has also reduced prices on all other computer configurations by an average of 15 percent.

Other announcements by the company included the debut of a 300 desktop-track (digit), four-color printer, an external optical drive and a 100 MB hard disk.

Jobs was asked if he thought the new version meant that Gimpel would be missing those. According to a new legal provision of the NeXTware software, not a definitive agreement from the Mac folks to make available an interface.

More information about NeXT products is available toll-free at 800-874-4206 (800-NEXTNEC).

—Mike Thomas, White Plains, New York
Editor, Computer Hardware

Comcast: Quarterdeck Promises DLSQviser

BY APRIL WASHINGTON, DC, JAN 25 (UPI)—As a owner of the Comcast communications show, Quarterdeck Office Systems, maker of the DLSQviser operating environment, was looking forward to DLSQviser.

This week, however, the DLSQviser and the Unisys T32Windows environment in a combined product due to be used as either or both operating systems.

Quarterdeck Office Systems started advertising DLSQviser last year in hopes of getting it on the market early in 1991. Now they are willing to wait until the first quarter of 1992. Bill Caudier, who founded Quarterdeck as a "Quarantine memory management" and that helped contribute to a stock delisting.

While the rest of the world talked on a number of networks, the Richard Johnson, staff engineer for Fairchild Engineering, the world's network manager, was at a McDonald's as a guest speaker, and they're excited that DLSQviser will make their connection to the PC software world simpler. That is because, for a DOS-compatible machine, X-Windows offers a graphical user interface, or GUI, that is offered by Microsoft Windows. With it, a developer can pay attention to the graphical instead of having to worry about the environment.

On the DLSQviser side, users may have a GUI with icons in them to help program designers specifically for it. In addition, they can have multitasking on a standard 486-based machine without losing the speed of the machine, unlike one under Microsoft Windows. It also has real multitasking and networking. It includes a UNIX and UNISYS interface for swapping information between applications.

—Mike Thomas, White Plains, New York
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 Trident 8000 SVGA adapter card with 1MB RAM
 14" DIAMOND series Mini-Tower Case
 200 Watt CSA approved Power Supply
 AAAAATHS Super VGA 14" Color Monitor 28ms
 2 Years Parts and Labour Warranty (Excludes)



\$2,777⁰⁰

CEX 386DX-40MHz Cache System

AMD 386DX-40MHz CPU
 Running @ 40MHz 16KB Cache Memory
 Socket for Math Coprocessor
 100 MB Maxi-cell 64K cache IDE Hard Drive
 4 Megabyte RAM (expandable to 20MB)
 3.5" (1.404GB) or 5.25" (1.44MB) TRAC Floppy Drive
 11 IDE controller (2 serial, 1 parallel, 1 game port)
 Clock/Calendar with Battery Backup AMI Bios
 Fujitsu soft media 101-key enhanced keyboard
 Trident 8000 SVGA adapter card with 1MB RAM
 14" DIAMOND series Mini-Tower Case
 200 Watt CSA approved Power Supply
 AAAAATHS Super VGA 14" Color Monitor 28ms
 2 Years Parts and Labour Warranty (Excludes)

\$1,737⁰⁰

CEX 486DX-33MHz Super System

Intel 80486DX-33MHz C.P.U. Running @ 33MHz
 144 KB cache memory (upgradeable to 220K cache)
 Built-in Math Coprocessor (Socket for MM2/100)
 100 MB Maxi-cell 64K cache IDE Hard Drive
 4 Megabyte RAM (expandable to 32MB)
 5.25" (1.404GB) or 3.5" (1.44MB) TRAC Floppy Drive
 11 IDE controller (2 serial, 1 parallel, 1 game port)
 Clock/Calendar with Battery Backup AMI Bios
 Fujitsu soft media 101-key enhanced keyboard
 Trident 8000 SVGA adapter card with 1MB RAM
 14" DIAMOND series Mini-Tower Case
 200 Watt CSA approved Power Supply
 AAAAATHS Super VGA 14" Color Monitor 28ms
 2 Years Parts and Labour Warranty (Excludes)



\$2,099⁰⁰

CEX 386DX-33MHz Computer System

AMD 386DX-33MHz CPU
 Running @ 33MHz 16KB Cache Memory
 Socket for Math Coprocessor
 100 MB Maxi-cell 64K cache IDE Hard Drive
 4 Megabyte RAM (expandable to 20MB)
 3.5" (1.404GB) or 5.25" (1.44MB) TRAC Floppy Drive
 11 IDE controller (2 serial, 1 parallel, 1 game port)
 Clock/Calendar with Battery Backup AMI Bios
 Fujitsu soft media 101-key enhanced keyboard
 Trident 8000 SVGA adapter card with 1MB RAM
 14" DIAMOND series Mini-Tower Case
 200 Watt CSA approved Power Supply
 AAAAATHS Super VGA 14" Color Monitor 28ms
 2 Years Parts and Labour Warranty (Excludes)

\$1,677⁰⁰

CEX 386DX-25MHz Computer System

Intel 80386DX-25 CPU
 Running @ 25MHz
 Socket for Math Coprocessor
 80 MB Maxi-cell 64K cache IDE Hard Drive
 1 Megabyte RAM (expandable to 16MB)
 3.5" (1.404GB) or 5.25" (1.44MB) TRAC Floppy Drive
 11 IDE controller (2 serial, 1 parallel, 1 game port)
 Clock/Calendar with Battery Backup AMI Bios
 Fujitsu soft media 101-key enhanced keyboard
 SMC 386 DXGA adapter card with 1.024MB RAM
 Diamond 1400MX series Mini-Tower Case
 200 Watt CSA approved Power Supply
 AAAAATHS Super VGA 14" Color Monitor 28ms
 2 Years Parts and Labour Warranty (Excludes)

\$1,399⁰⁰

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